A

TITLE OF THE INVENTION

System and Method for Video Communication

CROSS-REFERENCE TO RELATED APPLICATIONS

**[0001]** Not Applicable

- great job!
- very thorough
- detailed flowchart + figure w/ block diagram of system
- many alternatives
- you spent a serious amount of time on this + it is very good
- claims are tight + focused

## DETAILED DESCRIPTION OF THE INVENTION

**[0010]** Figure 1 illustrates a system for video communication 100 according to an embodiment of the present invention. The system for video communication 100 includes a controller 105, a VOIP teleconference connection 190, a personal computer 130, a Bluetooth wireless connection 195, a security module 135, and a door 180. The controller 105 includes an interactive video display 110, a speaker 115, a camera 120, and a microphone 125. In the present embodiment, the controller 105 is a 3G cell phone. The security module 135 includes a presence detector 140, a video screen 145, a speaker 150, a camera 155, a microphone 160, a lock actuator 165, and a door status detector 170. In the present embodiment, the presence detector 140 of the security module 135 is a doorbell. The door 180 includes a door lock 185.

**[0011]** In the system for video communication 100, the controller 105 is in communication with the personal computer 130 through the VOIP teleconference connection 190. The personal computer 130 is in communication with the security module 135 through the Bluetooth wireless connection 195. The security module 135 is physically connected to the door 180.

**[0012]** In operation, the presence detector 140 of the security module 135 detects the presence of a first person at the door 180 when the first person operates the presence detector 140 of the security module 135. Upon detecting the presence of the first person at the door 180, the security module 135 establishes an electronic video communication link between the security module 135 and the controller 105. The camera 155 of the

security module 135 determines images of the first person and the microphone 160 of the security module 135 determines audio from the first person. The security module 135 establishes the Bluetooth wireless connection 195 to the personal computer 130. The security module 135 sends the images of the first person and the audio from the first person to the personal computer 130 through the Bluetooth wireless connection 195. The personal computer 130 establishes the VOIP teleconference connection 190 with the controller 105, the controller 105 having video calling capabilities. The personal computer 130 then forwards the images of the first person and the audio from the first person to the controller 105 through the VOIP teleconference connection 190. The controller 105 displays the images of the first person to a second person through the interactive video display 110 of the controller 105. The controller 105 also plays the audio from the first person to the second person through the speaker 115 of the controller 105.

**[0013]** The camera 120 of the controller 105 determines images of the second person, and the microphone 125 of the controller 105 determines audio from the second person. The controller 105 then sends the images of the second person and the audio from the second person to the personal computer 130 through the VOIP teleconference connection 190. The personal computer 130 forwards the images of the second person and the audio from the second person to the security module 135 through the Bluetooth wireless connection 195. The security module 135 displays the images of the second person to the first person using the video screen 145 of the security module 135. The

security module 135 also plays the audio from the second person to the first person using the speaker 150 of the security module 135.

**[0014]** In operation, the controller 105 also displays status information from the security module 135 and the controller 105 allows the second person to send certain commands to the security module 135. The door 180 has an open state and a closed state. The door status detector 170 of the security module 135 generates status information by detecting whether the door 180 is in the open state or closed state. The door lock 185 of the door 180 has a locked state and an unlocked state. The lock actuator 165 of the security module 135 generates status information by detecting whether the door lock 185 of the door 180 is in the locked state or unlocked state. The security module 135 sends the status information from the door status detector 170 of the security module 135 and the lock actuator 165 of the security module 135 to the personal computer 130 through the Bluetooth wireless connection 195. The personal computer 130 forwards the status information from the door status detector 170 of the security module 135 and the lock actuator 165 of the security module 135 to the controller 105 by embedding the status information within control packets of the VOIP teleconference connection 190. The controller 105 displays the status information from the door status detector 170 of the security module 135 and the lock actuator 165 of the security module 135 to the second person on the interactive video display 110 of the controller 105 (as shown in Figure 2).

**[0015]** The second person issues a command to the security module 135 by inputting the command on the interactive video display 110 of the controller 105. In the current embodiment, the command is to lock or unlock the door lock 185 of the door 180.

The controller 105 sends the command to the personal computer 130 by embedding the command within control packets of the VOIP teleconference connection 190. The personal computer 130 forwards the command to the security module 135 through the Bluetooth wireless connection 195. The lock actuator 165 of the security module 135 implements the command by locking or unlocking the door lock 185 of the door 180.

**[0016]** In another embodiment, the controller 105 and personal computer 130 communicate by sending status information and commands over a TCP/IP connection, rather than embedding the status information and commands in the VOIP teleconference connection 190.

**[0017]** In another embodiment, the VOIP teleconference connection 190 utilizes the commercially available Skype or Skype mobile system.

**[0018]** In another embodiment, the personal computer 130 communicates with the security module 135 through an IEEE 802.11 wireless connection.

**[0019]** In another embodiment, the personal computer 130 communicates with the security module 135 through a wired connection.

**[0020]** In another embodiment, the security module 135 and controller 105 are in direct communication, rather than forwarding signals through a personal computer 130. The connection between the controller 105 and the security module 135 may be a Bluetooth wireless connection, an IEEE 802.11 wireless connection, a GPRS wireless connection, a wired connection, or any other connection suitable to transmitting audio, video, status information, and commands.

**[0021]** In another embodiment, using the interactive video display 110 of the controller 105, the second person selectively enables and disables the displaying of images of the second person on the video screen 145 of the security module 135 (as shown in Figure 2).

**[0022]** In another embodiment, using the interactive video display 110 of the controller 105, the second person selectively enables and disables the playing of audio from the second person through the speaker 150 of the security module 135 (as shown in Figure 2).

**[0023]** In other embodiments, the controller 105 does not have to be a 3G cell phone. It may be any electronic device capable of establishing a VOIP teleconference connection with the personal computer 130.

**[0024]** The controller 105 may alternatively be a personal computer, a tablet computer, such as an iPad, a telephone other than a cell phone, or any other device capable of displaying images, making sounds, determining images, determining sounds, displaying status information, accepting commands, and communicating with the personal computer 130 or security module 135.

**[0025]** In another embodiment, the elements of the controller 105 are included in the personal computer 130, so that the second person interacts directly with the personal computer 130 rather than the controller 105 to communicate with the first person, send commands to the security module 135, and receive status information from the security module 135.

**[0026]** In other embodiments, the security module 135 does not have to be physically connected to the door 180. The security module 135 can be located anywhere the second person would like to be able to interact with the first person through video communication. For example, the security module 135 can be positioned near a door or entrance to a building or room. The security module 135 can also be positioned on or near a gate to a premise.

**[0027]** In other embodiments, the security module 135 controls a lock other than a building door lock. The security module 135 may control an automotive door lock, a gate lock, or any other lock limiting access to a premise.

**[0028]** In other embodiments, the individual elements of the security module 135 can be divided among any number of discreet modules. For example, the video screen 145, speaker 150, microphone 160, lock actuator 165, and door status detector 170 can be included in a first module attached to the door 180, while the presence detector 140 and camera 155 are included in two other separate modules positioned near the door 180.

**[0029]** In another embodiment, detecting the presence of the first person near the door also causes an alert to be triggered in a building the door 180 is attached to. For example, when the first person operates the presence detector 140 of the security module 135, an audio alert can be produced at a speaker positioned inside the building. The speaker positioned inside the building can be integrated into the security module 135 or the personal computer 130, or otherwise positioned in the building where an occupant of the building would be capable of hearing the alert.

**[0030]** In other embodiments, the presence detector 140 of the security module 135 detects the presence of the first person at a location other than the door 180. For example the presence detector 140 of the security module 135 may detect the presence of the first person at an entrance to a building, at an entrance to a room, at an exterior side of an entrance, or at a location defined by a set of geographic coordinates.

**[0031]** In another embodiment, the security module 135 accepts and acts on various home automation commands from the controller 105 other than just to lock or unlock the door lock 185 of the door 180. For example, the security module 135 accepts commands and acts on commands to turn a light on or off, open or close a door, open or close a gate, or open or close a window blind.

**[0032]** In another embodiment, the second person interacts with the security module 135 through the controller 105 whenever the second person would like to interact with the security module 135, rather than relying on the detection of the first person's presence near the door 180 to initiate the connection between the controller 105 and the security module 135. For example, the second person may use the controller 105 to monitor the area near the security module 135. Additionally, the second person may want to communicate with a person near the security module 135 whose presence has not been detected. For example, a vandal may be destroying property near the security module 135, and the second person may desire to initiate communication with the vandal to scare the vandal away.

**[0033]** In another embodiment, permission is requested from the second person prior to displaying images of the second person to the first person. Permission is

requested by initiating a call between the personal computer 130 and the controller 105 through the VOIP teleconference connection 190. Permission to display images of the second person to the first person is granted by the second person's answering of the call initiated between the personal computer 130 and the controller 105. In other embodiments, permission may be requested and granted in various ways. For example, permission may be requested after the VOIP teleconference connection 190 is established by sending data from the personal computer 130 to the controller 105, the data containing a request for permission. Permission may be granted, for example, by the second person operating a button on the interactive video display 110 of the controller 105, and the controller 105 then sending data to the personal computer 130, the data containing a grant of permission.

**[0034]** In another embodiment, if the second person does not answer the call from the personal computer 130, the first person may leave a voicemail for the second person. The audio from the first person, determined by the microphone 155 of the security module 135, is sent from the security module 135 to the personal computer 130 through the Bluetooth wireless connection 195. The personal computer 130 connects to a voicemail system through the same VOIP teleconference connection 190 used to connect the personal computer 130 to the controller 105. The personal computer 130 then sends the audio from the first person to the voicemail system. The voicemail system saves the audio from the first person for later playback by the second person. Alternatively, when the voicemail system supports video, both the audio from the first person and the video of the first person may be sent to the voicemail system. Alternatively, the audio from the

first person and the video of the first person are saved as a voicemail message on the personal computer 130. The second person may then access the voicemail message from the personal computer 130 or have the voicemail message sent from the personal computer 130 to the controller 105 for accessing the voicemail message on the controller 105.

**[0035]** In another embodiment, the electronic video communication link is uni-directional. For example, the first person may be shown images of the second person, but the second person may not be shown images of the first person. Alternatively, the second person may be shown images of the first person, but the first person may not be shown images of the second person.

**[0036]** In another embodiment, the Bluetooth wireless connection 195 includes security measures. For example, data sent through the Bluetooth wireless connection 195 may be encrypted. Additionally, a device on each end of the Bluetooth wireless connection 195 may also perform parity checks and circular redundancy checks.

**[0037]** In another embodiment, the second person is required to manually authenticate before being able to communicate with the security module 135 from the controller 105. For example, the second person may be required to enter a command on the controller 105, the command including a personal identification number.

**[0038]** In another embodiment the system for video communication 100 includes a second controller. When the second person is communicating with the first person through the controller 105, the second person may transfer the ongoing communication to

the second controller. For example the second controller may be a second 3G cell phone. The second person enters a command on the controller 105 to transfer the ongoing communication. The controller 105 sends the command to the personal computer 130. The personal computer 130 then places a call to the second controller. When the second person answers the call on the second controller, the personal computer 130 joins the call with the second controller to the existing VOIP teleconference connection 190. The second person may then disconnect the controller 105 from the VOIP teleconference connection 190.

**[0039]** In another embodiment, the controller 105 includes a memory 280 (as shown in Figure 2) to store data containing audio and video. The second person may command the controller 105 to save the audio and video sent from the security module 135 and the audio and video sent from the controller 105 while the first person is communicating with the second person. This may be advantageous when the second person would like to replay at a later time a conversation the second person had with the first person.

**[0040]** Figure 2 illustrates the controller 105 of the system for video communication 100 according to an embodiment of the present invention. The controller 105 includes a CPU 250, a transceiver 260, a battery 270, the memory 280, the interactive video display 110, the speaker 115, the camera 120, and the microphone 125. The interactive video display 110 includes a video screen 205, a door ajar indicator 210, a lock door button 215, an unlock door button 220, a camera on button 225, a camera off

button 230, a microphone on button 235, a microphone off button 240, and a call local police button 245.

**[0041]** The transceiver 260 is electrically connected to the CPU 250 and the battery 270. The memory 280 is electrically connected to the CPU 250 and the battery 270. The microphone 125 is electrically connected to the CPU 250 and the battery 270. The camera 120 is electrically connected to the CPU 250 and the battery 270. The speaker 115 is electrically connected to the CPU 250 and the battery 270. The interactive video display 110 is electrically connected to the CPU 250 and the battery 270.

**[0042]** The interactive video display 110 is a touch-sensitive video interface capable of displaying images to a user. The video screen 205, door ajar indicator 210, lock door button 215, unlock door button 220, camera on button 225, camera off button 230, microphone on button 235, microphone off button 240, and call local police button 245 are displayed as images on the interactive video display 110.

**[0043]** In operation, the transceiver 260, CPU 250, interactive video display 110, microphone 125, camera 120, and speaker 115 are powered by the battery 270. The transceiver 260 communicates with the personal computer 130 through the VOIP teleconference connection 190. The transceiver 260 receives data from the personal computer 130, the data including images of the first person determined by the camera 155 of the security module 135, audio from the first person determined by the microphone 160 of the security module 135, status information from the door status detector 170 of the security module 135, and status information from the lock actuator 165 of the security module 135. The transceiver 260 sends the data received from the personal computer

130 to the CPU 250. The CPU 250 sends the images of the first person determined by the camera 155 of the security module 135, the status information from the door status detector 170 of the security module 135, and the status information from the lock actuator 165 of the security module 135 to the interactive video display 110. The CPU 250 sends the audio from the first person determined by the microphone 160 of the security module 135 to the speaker 115.

**[0044]** The speaker 115 plays the audio from the first person determined by the microphone 160 of the security module 135. The video screen 205 of the interactive video display 110 displays the images of the first person determined by the camera 155 of the security module 135. The door ajar indicator 210 indicates the status of the door 180 as detected by the door status detector 170 of the security module 135. When the door 180 is open, the door ajar indicator 210 indicates the door 180 is open, for example, by displaying the text "DOOR OPEN." When the door 180 is closed, the door ajar indicator 210 indicates the door 180 is closed, for example, by displaying the text "DOOR CLOSED."

**[0045]** The lock door button 215 of the interactive video display 110 indicates whether the door lock 185 of the door 180 is locked or unlocked by displaying a representation of the status information from the lock actuator 165 of the security module 135 (as shown in Figure 3). The unlock door button 220 of the interactive video display 110 also indicates whether the door lock 185 of the door 180 is locked or unlocked by displaying a representation of the status information from the lock actuator 165 of the security module 135 (as shown in Figure 3).

**[0046]** The camera 120 determines images of the second person and transmits the images of the second person to the CPU 250. The CPU 250 sends the images of the second person to the transceiver 260. The transceiver 260 then sends the images of the second person to the personal computer 130 for relaying to the security module 135.

**[0047]** The microphone 125 determines audio from the second person and transmits the audio from the second person to the CPU 250. The CPU 250 sends the audio from the second person to the transceiver 260. The transceiver 260 then sends the audio from the second person to the personal computer 130 for relaying to the security module 135.

**[0048]** The camera on button 225 of the interactive video display 110 and the camera off button 230 of the interactive video display 110 allow the second person to select whether the camera 120 determines images of the second person. When the camera on button 225 of the interactive video display 110 is selected, the camera 120 begins determining images of the second person. When the camera off button 230 of the interactive video display 110 is selected, the camera 120 stops determining images of the second person. When the camera 120 is determining images, the camera on button 225 of the interactive video display 110 and the camera off button 230 of the interactive video display 110 indicate that the camera 120 is determining images (as shown in Figure 3). When the camera 120 is not determining images, the camera on button 225 of the interactive video display 110 and the camera off button 230 of the interactive video display 110 indicate that the camera 120 is not determining images (as shown in Figure 3).

**[0049]** The microphone on button 235 of the interactive video display 110 and the microphone off button 240 of the interactive video display 110 allow the second person to select whether the microphone 125 determines audio of the second person. When the microphone on button 235 of the interactive video display 110 is selected, the microphone 125 begins determining audio of the second person. When the microphone off button 240 of the interactive video display 110 is selected, the microphone 125 stops determining audio of the second person. When the microphone 125 is determining audio, the microphone on button 235 of the interactive video display 110 and the microphone off button 240 of the interactive video display 110 indicate that the microphone 125 is determining audio (as shown in Figure 3). When the microphone 125 is not determining audio, the microphone on button 235 of the interactive video display 110 and the microphone off button 240 of the interactive video display 110 indicate that the microphone 125 is not determining audio (as shown in Figure 3).

**[0050]** The lock door button 215 of the interactive video display 110 allows the second person to send a command to the lock actuator 160 of the security module 135 to lock the door lock 185 of the door 180. When the second person selects the lock door button 215 of the interactive video display 110, an electronic command to lock the door lock 185 of the door 180 is sent from the interactive video display 110 to the CPU 250. The CPU 250 sends the electronic command to lock the door lock 185 of the door 180 to the transceiver 260. The transceiver 260 then sends the electronic command to lock the door lock 185 of the door 180 to the personal computer 130 through the VOIP

teleconference connection for forwarding to the lock actuator 160 of the security module 135.

**[0051]** The unlock door button 220 of the interactive video display 110 allows the second person to send a command to the lock actuator 160 of the security module 135 to unlock the door lock 185 of the door 180. When the second person selects the unlock door button 220 of the interactive video display 110, an electronic command to unlock the door lock 185 of the door 180 is sent from the interactive video display 110 to the CPU 250. The CPU 250 sends the electronic command to unlock the door lock 185 of the door 180 to the transceiver 260. The transceiver 260 then sends the electronic command to unlock the door lock 185 of the door 180 to the personal computer 130 through the VOIP teleconference connection for forwarding to the lock actuator 160 of the security module 135.

**[0052]** The call local police button 245 allows the second person to initiate a telephone call to a law enforcement agency. A telephone number used to initiate the telephone call to the law enforcement agency is stored in the memory 280. When the second person selects the call local police button 245, the interactive video display 110 sends to the CPU 250 a command to initiate the telephone call to the law enforcement agency. The CPU 250 retrieves the telephone number from the memory 280. The CPU 250 then commands the transceiver 260 to initiate the call to the law enforcement agency using the telephone number retrieved from the memory 280. When the transceiver 260 has initiated the call to the law enforcement agency, the second person may communicate

verbally through the controller with the law enforcement agency. An example of when this may be beneficial is when a violent person is present at the door 180.

**[0053]** In other embodiments, various indicators may be included on the interactive video display 110 in addition to or in lieu of the door ajar indicator 210. Examples are indicators to indicate whether a gate is open or closed, whether a light is on or off, and whether window blinds are open or closed. As with the door ajar indicator 210, these various indicators display a status based on data sent from the security module 135.

**[0054]** In another embodiment, buttons are included on the interactive video display 110 to toggle whether the images of the first person are displayed on the video screen 205 of the interactive video display 110 and whether the audio from the first person is played through the speaker 115. These features may be useful, for example, if the first person is doing or saying something offensive.

**[0055]** In another embodiment, the microphone 125 is powered through its connection to the CPU 250, rather than the microphone 125 being connected to the battery 270.

**[0056]** In another embodiment, the speaker 115 is powered through its connection to the CPU 250, rather than the speaker 115 being connected to the battery 270.

**[0057]** In another embodiment, the lock door button 215 of the interactive visual display 110, unlock door button 220 of the interactive visual display 110, camera on button 225 of the interactive visual display 110, camera off button 230 of the interactive

visual display 110, microphone on button 235 of the interactive visual display 110, microphone off button 240 of the interactive visual display 110, and call local police button 245 of the interactive visual display 110 are mechanical switches, instead of touch-sensitive images. The mechanical switches may be dedicated switches, such as an individual mechanical switch for each of the buttons. The mechanical switches may also be multi-function switches. For example, the mechanical switches may be a numeric keypad, wherein a numeric key may be mapped as the camera off button 230 in one mode but remapped as the lock door button 215 in a second mode.

**[0058]** In another embodiment, the lock door button 215 of the interactive visual display 110, unlock door button 220 of the interactive visual display 110, camera on button 225 of the interactive visual display 110, camera off button 230 of the interactive visual display 110, microphone on button 235 of the interactive visual display 110, microphone off button 240 of the interactive visual display 110, and call local police button 245 of the interactive visual display 110 are displayed as images on a video screen, but not touch-sensitive images. A button may be operated by selecting the button using an input device such as a trackball, computer mouse, computer keyboard, or laptop computer touch-sensitive trackpad.

**[0059]** In another embodiment, the door ajar indicator 210 of the interactive visual display 110 is a physical indicator, such as a light-emitting diode, rather than an image. The door ajar indicator 210 displays the status of the door by emitting or not emitting light.

**[0060]** In another embodiment, the CPU 250 compresses the images from the camera 120 before sending the images from the camera 120 to the transceiver 260. The compression method may be H.263 or any other method suitable for compressing video.

**[0061]** In another embodiment, the CPU 250 compresses the audio from the microphone 125 before sending the audio from the microphone 125 to the transceiver 260. The compression method may be any method suitable for compressing audio.

**[0062]** In other embodiments, selecting the camera off button 230 of the interactive video display 110 does not stop the camera 120 from determining images, but rather stops the images determined by the camera 120 from being displayed to the first person. This may be accomplished by stopping the sending of the images from the CPU 250 to the transceiver 260, stopping the sending of the images from the transceiver 260 to the personal computer 130, stopping the sending of the images from the personal computer 130 to the security module 135, or stopping the displaying of the images on the video screen 145 of the security module 135.

**[0063]** In other embodiments, selecting the microphone off button 240 of the interactive video display 110 does not stop the microphone 125 from determining audio, but rather stops the audio determined by the microphone 125 from being played to the first person. This may be accomplished by stopping the sending of the audio from the CPU 250 to the transceiver 260, stopping the sending of the audio from the transceiver 260 to the personal computer 130, stopping the sending of the audio from the personal computer 130 to the security module 135, or stopping the playing of the audio through the speaker screen 150 of the security module 135.

**[0064]** In another embodiment, the door ajar indicator 210 of the interactive video display 110 further is a button for initiating a command. The security module 135 further includes a door actuator 660 (as shown in Figure 6) for alternating the door 180 between an open and closed state. When the door ajar indicator 210 of the interactive video display 110 is selected, an electronic command to operate the door actuator 660 of the security module 135 is sent from the interactive video display 110 to the CPU 250. The CPU 250 sends the electronic command to operate the door actuator 660 of the security module 135 to the transceiver 260. The transceiver 260 sends the electronic command to operate the door actuator 660 of the security module 135 to the personal computer 130 through the VOIP teleconference connection. The personal computer 130 sends the electronic command to operate the door actuator 660 of the security module 135 to the security module 135. When the door 180 is open, the security module 135 then operates the door actuator 660 to close the door 180. When the door 180 is closed, the security module 135 then operates the door actuator 660 to open the door 180.

**[0065]** In another embodiment, there is a second transceiver connected to the CPU 250 and to the battery 270. When the call local police button 245 is selected, the second transceiver is used to communicate with the law enforcement agency rather than the transceiver 260. The second transceiver may communicate with the law enforcement agency though a GSM connection, CDMA connection, VOIP connection, or any other type of connection suitable for placing a telephone call.

**[0066]** In another embodiment, when the call local police button 245 is selected, the personal computer 130 places the telephone call to the law enforcement agency. The

personal computer 130 then includes the telephone call to the law enforcement agency in the existing VOIP teleconference connection 190 between the personal computer 130 and controller 105. The personal computer 130 therefore sets up a three-way teleconference call among the first person, the second person, and the law enforcement agency. The telephone number to call may be sent from the controller 105 to the personal computer 130, or the personal computer 130 may have the telephone number stored in a memory 420 of the personal computer 130 (as shown in Figure 4).

**[0067]** In another embodiment, the telephone number stored in the memory 280 is a telephone number for calling anyone the second person would like to call upon selecting the call local police button 245, not necessarily a law enforcement agency.

**[0068]** In another embodiment, selecting the call local police button 245 causes a message to be sent rather than initiating a telephone call. The message may be an SMS message sent from the controller 105 to another cell phone. The message may alternatively be an email message sent from the controller 105 to an email server.

**[0069]** In another embodiment, a transmitter and a receiver, each electrically connected to the CPU 250 and to the battery 270, replace the transceiver 260. The transmitter transmits the data from the CPU 250 through the VOIP teleconference connection 190 that the transceiver 260 would otherwise transmit. The receiver receives the data from the personal computer 130 through the VOIP teleconference connection 190 that the transceiver 260 would otherwise receive.

**[0070]** In another embodiment, the controller 105 includes a position detector. The position detector may be a hardware global positioning system (GPS) detector or a software application that contacts a position detection system provided by a cell phone service provider, such as an Enhanced 911 system (E-911). When the first person operates the call local police button 245 of the interactive video display 110, the current position of the controller 105 as detected by the position detector is transmitted to the party called as a result of operating the call local police button 245 of the interactive video display 110.

**[0071]** Figure 3 illustrates the interactive video display 110 of the controller 105 according to an embodiment of the present invention. The interactive video display 110 includes the video screen 205, the door ajar indicator 210, the lock door button 215, a lock door button border 315, the unlock door button 220, an unlock door button border 320, the camera on button 225, a camera on button border 325, the camera off button 230, a camera off button border 330, the microphone on button 235, a microphone on button border 335, the microphone off button 240, a microphone off button border 340, and the call local police button 245.

**[0072]** The interactive video display 110 is a touch-sensitive video display with the video screen 205, buttons, button borders, and door ajar indicator 210 arranged on the touch-sensitive video display for interaction with the second person. The video screen 205 is positioned near a top of the interactive video display 110. The door ajar indicator 210 is positioned below the video screen 205. The lock door button 215 and unlock door button 220 are positioned side by side and below the door ajar indicator 210. The lock

door button border 315 defines a perimeter of the lock door button 215. The unlock door button border 320 defines a perimeter of the unlock door button 220. The camera on button 225 and camera off button 230 are positioned side by side and below the lock door button 215 and unlock door button 220. The camera on button border 325 defines a perimeter of the camera on button 225. The camera off button border 330 defines a perimeter of the camera off button 230. The microphone on button 235 and microphone off button 240 are positioned side by side and below the camera on button 225 and camera off button 230. The microphone on button border 335 defines a perimeter of the microphone on button 235. The microphone off button border 340 defines a perimeter of the microphone off button 240. The call local police button 245 is positioned below the microphone on button 235 and the microphone off button 240.

**[0073]** In operation, the elements of the interactive video display 110 shown in Figure 2 operate as shown in Figure 2. Further describing the operation of the interactive video display 110, the lock door button border 315 may be displayed as a thin line or a thick line to indicate whether the door lock 185 of the door 180 is currently locked or unlocked. When the door lock 185 of the door 180 is locked, the lock door button border 315 is displayed as a thick line. When the door lock 185 of the door 180 is unlocked, the lock door button border 315 is displayed as a thin line. The unlock door button border 320 may be displayed as a thin line or a thick line to indicate whether the door lock 185 of the door 180 is currently locked or unlocked. When the door lock 185 of the door 180 is unlocked, the unlock door button border 320 is displayed as a thick line. When the

door lock 185 of the door 180 is locked, the unlock door button border 320 is displayed as a thin line.

**[0074]** The camera on button border 325 may be displayed as a thin line or a thick line to indicate whether images of the second person are being displayed to the first person on the video screen 145 of the security module 135. When images of the second person are being displayed to the first person on the video screen 145 of the security module 135 the camera on button border 325 is displayed as a thick line. When images of the second person are not being displayed to the first person on the video screen 145 of the security module 135 the camera on button border 325 is displayed as a thin line.

**[0075]** The camera off button border 330 may be displayed as a thin line or a thick line to indicate whether images of the second person are being displayed to the first person on the video screen 145 of the security module 135. When images of the second person are being displayed to the first person on the video screen 145 of the security module 135 the camera off button border 330 is displayed as a thin line. When images of the second person are not being displayed to the first person on the video screen 145 of the security module 135 the camera off button border 330 is displayed as a thick line.

**[0076]** The microphone on button border 335 may be displayed as a thin line or a thick line to indicate whether audio from the second person is being played to the first person through the speaker 150 of the security module 135. When audio from the second person is being played to the first person through the speaker 150 of the security module 135 the microphone on button border 335 is displayed as a thick line. When audio from

the second person is not being played to the first person through the speaker 150 of the security module 135 the microphone on button border 335 is displayed as a thin line.

**[0077]** The microphone off button border 340 may be displayed as a thin line or a thick line to indicate whether audio from the second person is being played to the first person through the speaker 150 of the security module 135. When audio from the second person is being played to the first person through the speaker 150 of the security module 135 the microphone off button border 340 is displayed as a thin line. When audio from the second person is not being played to the first person through the speaker 150 of the security module 135 the microphone off button border 340 is displayed as a thick line.

**[0078]** In another embodiment, a warning dialog is displayed on the interactive video display 110 when one of the buttons is selected. The warning dialog asks the second person whether he or she wants to perform an action associated with the selected button. The warning dialog acts as a "safety" to prevent accidentally unlocking the door lock 185 of the door 180, calling the local police, or performing any of the other actions commandable by the interactive video display 110.

**[0079]** In another embodiment, operating any of the buttons on the interactive video display 110 requires that the second person touch and remain in contact with the button for a predetermined amount of time, preferably 500 milliseconds. This lessens the chance of a button being accidentally selected.

**[0080]** In another embodiment, buttons on the interactive video display 110 are grouped in pairs and act as "toggles." The lock door button 215 is paired with the unlock

door button 220. The camera on button 225 is paired with the camera off button 230. The microphone on button 235 is paired with the microphone off button 240. One button in each pair has a thick border, while the other button in each pair has a thin border, indicating the current status of the action associated with each button. Selecting either button of a pair causes the controller 105 to act as if the button with the thin border had been selected (as shown in Figure 2). For example, when the door lock 185 of the door 180 is locked, the lock door button border 315 will be thick and the unlock door button border 320 will be thin. Selecting the lock door button 215 will unlock the door lock 185 of the door 180, the lock door button border 315 will change to thin, and the unlock door button border 320 will change to thick. Pressing the lock door button 215 again will lock the door lock 185 of the door 180, the lock door button border 315 will change back to thick, and the unlock door button border 320 will change back to thin.

**[0081]** In other embodiments, the current status of the actions associated with the buttons may be indicated by any means capable of distinguishing a first button state from a second button state. For example, the lock door button 215 may be shown with a dark background when the door lock 185 of the door 180 is locked, and the lock door button 215 may be shown with a light background when the door lock 185 of the door 180 is unlocked. As a further example, a button may include text that alternates between two options. The door lock button 215 may have text indicating "DOOR LOCKED" when the door lock 185 of the door 180 is locked, and the door lock button 215 may have text indicating "LOCK DOOR" when the door lock 185 of the door 180 is unlocked.

**[0082]** In other embodiments, the current status of the actions associated with the buttons may be displayed by indicators separate from the buttons. For example, the controller 105 may include a light-emitting diode, wherein the light-emitting diode emits light when the door lock 185 of the door 180 is in the locked state, but does not emit light when the door lock 185 of the door 180 is in the unlocked state.

**[0083]** In another embodiment, the video screen 205, buttons, and door ajar indicator 210 may be arranged in any layout on the interactive video display 110 that allows the second person to interact with the video screen 205, buttons, and door ajar indicator 210.

**[0084]** Figure 4 illustrates the personal computer 130 according to an embodiment of the present invention. The personal computer 130 includes a transceiver 405, a CPU 410, a network interface 415, a memory 420, a keyboard 425, a computer mouse 430, a computer monitor 435, a microphone 440, a speaker 445, and a camera 450. In the present embodiment, the transceiver 405 is a Bluetooth dongle.

**[0085]** The transceiver 405 is electrically connected to the CPU 410. The transceiver 405 is also communicably connected to the security module 135. The network interface 415 is electrically connected to the CPU 410. The memory 420 is electrically connected to the CPU 410. The keyboard 425 is electrically connected to the CPU 410. The computer mouse 430 is electrically connected to the CPU 410. The computer monitor 435 is electrically connected to the CPU 410. The microphone 440 is electrically connected to the CPU 410. The speaker 445 is electrically connected to the CPU 410. The camera 450 is electrically connected to the CPU 410.

**[0086]** In operation, the keyboard 425, computer mouse 430, and computer monitor 435 are used to configure the personal computer 130. The CPU 410 sends to the computer monitor 435 images representing configuration options. The computer monitor 435 displays the configuration options. The keyboard 425 or computer mouse 430 is used to select a configuration option displayed on the computer monitor 435. The keyboard 425 or computer mouse 430 is then used to send a configuration parameter to the CPU 410. The CPU 410 then sends the configuration parameter to the memory 420 for storage for later retrieval. For example, one configuration option may be used to enter the telephone number associated with the controller 105, so that the personal computer 130 is able to initiate the VOIP teleconference connection 190 from the personal computer 130 to the controller 105. Another configuration option may be used to enter a Bluetooth device ID associated with a transceiver 610 of the security module 135 (as shown in Figure 6), so that the personal computer 130 is able to communicate with the security module 135 through the Bluetooth wireless connection 195.

**[0087]** The transceiver 405 transfers communications between the personal computer 130 and the security module 135. In this embodiment, the transceiver 405 communicates with the transceiver 610 of the security module 135 through the Bluetooth wireless connection 195. The network interface 415 transfers communications between the personal computer 130 and the controller 105. In this embodiment, the network interface 415 communicates with the transceiver 260 of the controller 105 (as shown in Figure 2) through the VOIP teleconference connection 190. The CPU 410 passes communications between the transceiver 405 and the network interface 415, allowing the

personal computer 130 to act as a "bridge" passing communications between the security module 135 and the controller 105.

**[0088]** In operation, the CPU 410 requests the telephone number associated with the controller 105 from the memory 420. The memory 420 sends the telephone number associated with the controller 105 to the CPU 410. The CPU 410 then uses the telephone number associated with the controller 105 to create the VOIP teleconference connection 190 between the network interface 415 and the transceiver 260 of the controller 105. The CPU 410 also requests the Bluetooth device ID associated with the transceiver 610 of the security module 135 from the memory 420. The memory 420 sends the Bluetooth device ID associated with the transceiver 610 of the security module 135 to the CPU 410. The CPU 410 then uses the Bluetooth device ID associated with the transceiver 610 of the security module 135 to create the Bluetooth wireless connection 195 between the transceiver 405 and the transceiver 610 of the security module 135.

**[0089]** The transceiver 405 receives data from the transceiver 610 of the security module 135, the data including the images of the first person determined by the camera 155 of the security module 135, the audio from the first person determined by the microphone 160 of the security module 135, the status information from the door status detector 170 of the security module 135, and the status information from the lock actuator 165 of the security module 135. The transceiver 405 sends to the CPU 410 the data received from the transceiver 610 of the security module 135. The CPU 410 converts data received from the transceiver 405 into a format suitable for transmission through the VOIP teleconference connection 190. This may include embedding the status

information from the door status detector 170 of the security module 135 and the status information from the lock actuator 165 of the security module 135 within control packets of the VOIP teleconference connection 190. The CPU 410 then sends to the network interface 415 the converted version of the data received from the transceiver 405. The network interface 415 sends to the transceiver 260 of the controller 105 through the VOIP teleconference connection 190 the data received from the CPU 410.

**[0090]** The network interface 415 receives data through the VOIP teleconference connection 190 from the transceiver 260 of the controller 105, the data including images of the second person determined by the camera 120 of the controller 105, audio from the second person determined by the microphone 125 of the controller 105, and commands from the interactive video display 110 of the controller 105. The commands from the interactive video display 110 of the controller 105 may be embedded in control packets of the VOIP teleconference connection 190. The network interface 415 sends the data received from the transceiver 260 of the controller 105 to the CPU 410. The CPU 410 converts data received from the network interface 415 to a format suitable for transmission through the Bluetooth wireless connection 195. The CPU 410 then sends the converted data to the transceiver 405. The transceiver 405 sends data received from the CPU 410 to the transceiver 610 of the security module 135 through the Bluetooth wireless connection 195.

**[0091]** In another embodiment, the personal computer 130 performs some functions normally performed by the controller 105. When the CPU 410 receives the data from the transceiver 405, the CPU 410 does not forward the data to the network

interface 415. Instead, the images of the first person determined by the camera 155 of the security module 135 are sent from the CPU 410 to the computer monitor 435 and displayed on the computer monitor 435. The audio from the first person determined by the microphone 160 of the security module 135 is sent from the CPU 410 to the speaker 445 and played through the speaker 445. The status information from the door status detector 170 of the security module 135 is rendered as an image, sent from the CPU 410 to the computer monitor 435, and the image is displayed on the computer monitor 435. The status information from the lock actuator 165 of the security module 135 is rendered as an image, sent from the CPU 410 to the computer monitor 435, and the image is displayed on the computer monitor 435.

**[0092]** Additionally, in this another embodiment, the CPU 410 does not receive from the network interface 415 data including images of the second person determined by the camera 120 of the controller 105, audio from the second person determined by the microphone 125 of the controller 105, and commands from the interactive video display 110 of the controller 105. Instead, images of the second person are determined by the camera 450, and data including the images of the second person determined by the camera 450 is sent from the camera 450 to the CPU 410. Audio from the second person is determined by the microphone 440, and data including the audio from the second person is sent from the microphone 440 to the CPU 410. The computer monitor 435 displays buttons for commanding the same commands commandable from the interactive video display 110 of the controller 105 (as shown in Figure 3). The second person selects a command on the computer monitor 435 using the keyboard 425 or computer mouse

430, and the keyboard 425 or computer mouse 430 sends the selected command to the CPU 410. The CPU 410 then sends data to the transceiver 405, the data including images of the second person determined by the camera 450, audio from the second person determined by the microphone 440, and the command sent from the keyboard 425 or computer mouse 430. The transceiver 405 still sends data received from the CPU 410 to the transceiver 610 of the security module 135 through the Bluetooth wireless connection 195.

**[0093]** In another embodiment, a user may use the personal computer 130 to check that the Bluetooth wireless connection 195 between the personal computer 130 and the security module 135 is working. The user selects a command with the computer mouse 430 or the keyboard 425, the command being to verify the Bluetooth wireless connection 195. The CPU 410 determines a status of the Bluetooth wireless connection 195 by communicating with the transceiver 405 to check if the Bluetooth wireless connection 195 is working. The CPU 410 then displays the status of the Bluetooth wireless connection 195 to the user through the computer monitor 435.

**[0094]** In other embodiments, a user may configure the personal computer 130 and select commands on the computer monitor 435 using any suitable computer input device. Examples are a trackball, a touch-sensitive laptop computer trackpad, or a touch-sensitive computer monitor.

**[0095]** In another embodiment, the keyboard 425 communicates with the CPU 410 through radio communication.

**[0096]** In another embodiment, the computer mouse 430 communicates with the CPU 410 through radio communication.

**[0097]** In other embodiments, the keyboard 425, computer mouse 430, and computer monitor 435 may be used to configure additional options on the personal computer 130. Example additional options are whether the first person is allowed to leave a voicemail for the second person, and whether operating the presence detector 140 of the security module 135 causes a visual alert to appear on the computer monitor 435 or an audio alert to be played through the speaker 445.

**[0098]** In another embodiment, the personal computer 130 does not include the microphone 440, and the personal computer 130 does not include the camera 450.

**[0099]** In other embodiments, the transceiver 405 may operate using any radio protocol able to transmit and receive data including images, audio, status information, and commands. An example alternate protocol is IEEE 802.11.

**[00100]** In another embodiment, the personal computer 130 communicates with the security module 135 through a wired connection. The transceiver 405 and transceiver 610 of the security module 135 are not required. Instead the CPU 410 is electrically connected to a CPU 620 of the security module 135 (as shown in Figure 6), and data is sent between the CPU 410 and the CPU 620 of the security module 135.

**[00101]** In another embodiment, the network interface 415 is a computer modem. The network interface 415 communicates with the transceiver 260 of the controller 105 through a telephone network.

**[00102]** In another embodiment, the network interface 415 sends status information to the transceiver 260 of the controller 105 and receives commands from the transceiver 260 of the controller 105 through a TCP/IP connection, rather than embedding the status information and commands in control packets of the VOIP teleconference connection 190.

**[00103]** Figure 5 illustrates a ~~method~~ flowchart 500 for transmitting data ~~500~~ in a system for video communication according to an embodiment of the present invention. The method for transmitting data 500 includes a first step 505, a second step 510, a decision 515, a third step 520, a fourth step 525, a fifth step 530, a sixth step 535, a seventh step 540, and an eighth step 545.

**[00104]** In the ~~method~~ flowchart for transmitting data 500, the first step 505 is to receive a request from a security module to initiate a call. A personal computer, such as the personal computer 130 (as shown in Figure 4) receives the request. A security module, such as the security module 135 (as shown in Figure 6) sends the request. The second step 510 is to initiate a call to a controller. The personal computer initiates the call to a controller such as the controller 105 (as shown in Figure 2). The decision 515 is whether or not the controller answers the call.

**[00105]** If the controller does not answer the call at the decision 515, the method proceeds to the third step 520. The third step 520 is to receive data containing audio from the security module. The audio is audio from a person, such as from the first person (as shown in Figure 1). Next, the fourth step 525 is to leave a voicemail. The personal

computer leaves a voicemail on the controller's voicemail system by transmitting the audio to the voicemail system.

**[00106]** If the controller does answer the call at the decision 515, the method proceeds from the second step 510 to the fifth step 530. The fifth step 530 is to receive data from the security module. The personal computer receives data from the security module. The data may contain audio, video, lock status information, and door status information (as shown in Figure 6). Next, the sixth step 535 is to transmit the data from the security module to the controller. The personal computer acts as a "bridge" between the security module and the controller and transmits the data received from the security module to the controller.

**[00107]** The seventh step 540 is to receive data from the controller. The personal computer receives data from the controller. The data may contain audio, video, and commands for the security module. The eighth step 545 is to transmit the data from the controller to the security module. The personal computer again acts as a "bridge" between the security module and the controller and transmits the data received from the controller to the security module.

**[00108]** In another embodiment, the fourth step 525 to leave a voicemail is accomplished by recording a voicemail message to a memory of the personal computer, such as the memory 420 of the personal computer 130 (as shown in Figure 4).

**[00109]** In another embodiment, the third step 520 is to receive data including both audio and video data. The audio is still from a person, such as the first person (as shown

in Figure 1). The video is of the same person. Then, the fourth step 525 is to leave a voicemail message, either on the controller's voicemail system or on a memory of the personal computer, wherein the voicemail message includes both audio and video.

**[00110]** In another embodiment, the data received in the seventh step 540 may also include commands for the personal computer.

**[00111]** Figure 6 illustrates the security module 135 according to an embodiment of the present invention. The security module 135 includes the transceiver 610, the CPU 620, an ~~AlwaysHome~~ display 630, a battery 640, high-bandwidth connections 650, the lock actuator 160, the door status detector 165, and a door actuator 660. The AlwaysHome display 630 includes the presence detector 140, the camera 155, the microphone 160, the video screen 145, and the speaker 150.

**[00112]** The transceiver 610, CPU 620, AlwaysHome display 630, door status detector 165, lock actuator 160, and door actuator 660 are electrically connected to the battery 640. The transceiver 610 is electrically connected to the CPU 620. The door status detector 165 is electrically connected to the CPU 620. The lock actuator 160 is electrically connected to the CPU 620. The door actuator 660 is electrically connected to the CPU 620. The AlwaysHome display 630 is electrically connected to the CPU 620. The presence detector 140 of the AlwaysHome display 630 is positioned on the AlwaysHome display 630 to detect the first person. The camera 155 of the AlwaysHome display 630 is positioned on the AlwaysHome display 630 to determine images of the first person. The microphone 160 of the AlwaysHome display 630 is positioned on the AlwaysHome display 630 to determine audio from the first person. The video screen 145

of the AlwaysHome display 630 is positioned on the AlwaysHome display 630 to be viewable by the first person. The speaker 150 of the AlwaysHome display 630 is positioned on the AlwaysHome display 630 to play audio to the first person.

**[00113]** In operation, the battery 640 provides power to the transceiver 610, CPU 620, AlwaysHome display 630, door status detector 165, lock actuator 160, and door actuator 660. The door status detector 165 is a magnetic sensor that detects whether or not a magnet attached with adhesive tape to a door frame generally surrounding the door 180 is near the door status detector 165. When the door 180 is closed, the magnet is near the door status detector 165. When the door is open, the magnet is not near the door status detector 165. When the magnet is near the door status detector 165, the door status detector 165 sends a communication to the CPU 620 that includes the status of the door 180 as closed. When the magnet is not near the door status detector 165, the door status detector 165 sends a communication to the CPU 620 that includes the status of the door 180 as open.

**[00114]** The lock actuator 160 is a magnetic solenoid that alternates the door lock 185 of the door 180 between a locked and an unlocked state. The lock actuator 160 also determines the current status of the door lock 185 of the door 180 and reports the current status of the door lock 185 of the door 180 to the CPU 620. When the door lock 185 of the door 180 is locked, the lock actuator 160 sends a communication to the CPU 620 that includes the status of the door lock 185 of the door 180 as locked. When the door lock 185 of the door 180 is unlocked, the lock actuator 160 sends a communication to the CPU 620 that includes the status of the door lock 185 of the door 180 as unlocked.

**[00115]** The door actuator 660 is an electromechanical actuator that alternates the door 180 between a closed and an open state.

**[00116]** In the present embodiment, the presence detector 140 of the AlwaysHome display 630 is a doorbell that detects the presence of the first person near the door 180 by the first person operating the doorbell. When the first person operates the presence detector 140 of the AlwaysHome display 630, the AlwaysHome display 630 sends a communication to the CPU 620 indicating the presence of a person near the door 180 has been detected. The CPU 620 then sends a communication to the AlwaysHome display 630 commanding the camera 155 of the AlwaysHome display 630 to begin determining images of the first person and the microphone 160 of the AlwaysHome display 630 to begin determining audio from the first person. The camera 155 of the AlwaysHome display 630 determines images of the first person and the microphone 160 of the AlwaysHome display 630 determines audio from the first person.

**[00117]** The AlwaysHome display 630 sends data to the CPU 620, the data including images of the first person determined by the camera 155 of the AlwaysHome display 630 and audio from the first person determined by the microphone 160 of the AlwaysHome display 630. The CPU 620 compresses the images of the first person determined by the camera 155 of the AlwaysHome display 630 using H.263. The CPU 620 then sends data to the transceiver 610, the data including compressed images of the first person determined by the camera 155 of the AlwaysHome display 630, audio from the first person determined by the microphone 160 of the AlwaysHome display 630, the current status of the door 180 as reported by the door status detector 165, and the current

status of the door lock 185 of the door 180 as reported by the lock actuator 160. The transceiver 610 sends data received from the CPU 620 to the transceiver 405 of the personal computer 130 through the Bluetooth wireless connection 195 for forwarding to the controller 105.

**[00118]** The transceiver 610 receives data from the transceiver 405 of the personal computer 130 through the Bluetooth wireless connection 195, the data including images of the second person determined by the camera 120 of the controller 105, audio from the second person determined by the microphone 125 of the controller 105, and commands from the interactive video display 110 of the controller 105. The commands from the interactive video display 110 of the controller 105 may include commands to operate the lock actuator 160, to operate the door actuator 660, to stop or start the determining of images by the camera 155 of the AlwaysHome display 630, to stop or start the determining of audio by the microphone 160 of the AlwaysHome display 630, to stop or start the displaying of images by video screen 145 of the AlwaysHome display 630, and to stop or start the playing of audio through the speaker 150 of the AlwaysHome display 630.

**[00119]** The transceiver 610 sends to the CPU 620 the data received from the transceiver 405 of the personal computer 130. When the images of the second person in the data received from the transceiver 610 are compressed, the CPU 620 decompresses the images of the second person in the data received from the transceiver 610. The CPU 620 then sends data to the AlwaysHome Display 630, the data including uncompressed images of the second person and the audio from the second person. The video screen 145

of the AlwaysHome display 630 displays the uncompressed images of the second person received from the CPU 620. The speaker 150 of the AlwaysHome display 630 plays the audio from the second person received from the CPU 620.

**[00120]** When the data received by the CPU 620 from the transceiver 610 includes a command to operate the lock actuator 160, the CPU 620 commands the lock actuator 160 to change the status of the door lock 185 of the door 180. When the door lock 185 of the door 180 is locked, the lock actuator 160 unlocks the door lock 185 of the door 180. When the door lock 185 of the door 180 is unlocked, the lock actuator 160 locks the door lock 185 of the door 180.

**[00121]** When the data received by the CPU 620 from the transceiver 610 includes a command to operate the door actuator 660, the CPU 620 commands the door actuator 660 to change the status of the door 180. When the door 180 is open, the door actuator 660 closes the door 180. When the door 180 is closed, the door actuator 660 opens the door 180.

**[00122]** When the data received by the CPU 620 from the transceiver 610 includes a command to stop the determining of images by the camera 155 of the AlwaysHome display 630, the CPU 620 commands the camera 155 of the AlwaysHome display 630 to stop determining images, and the camera 155 of the AlwaysHome display 630 stops determining images. When the data received by the CPU 620 from the transceiver 610 includes a command to start the determining of images by the camera 155 of the AlwaysHome display 630, the CPU 620 commands the camera 155 of the AlwaysHome

display 630 to start determining images, and the camera 155 of the AlwaysHome display 630 starts determining images.

**[00123]** When the data received by the CPU 620 from the transceiver 610 includes a command to stop the determining of audio by the microphone 160 of the AlwaysHome display 630, the CPU 620 commands the microphone 160 of the AlwaysHome display 630 to stop determining audio, and the microphone 160 of the AlwaysHome display 630 stops determining audio. When the data received by the CPU 620 from the transceiver 610 includes a command to start the determining of audio by the microphone 160 of the AlwaysHome display 630, the CPU 620 commands the microphone 160 of the AlwaysHome display 630 to start determining audio, and the microphone 160 of the AlwaysHome display 630 starts determining audio.

**[00124]** When the data received by the CPU 620 from the transceiver 610 includes a command to stop the displaying of images by the video screen 145 of the AlwaysHome display 630, the CPU 620 commands the video screen 145 of the AlwaysHome display 630 to stop displaying images, and the video screen 145 of the AlwaysHome display 630 stops displaying images. When the data received by the CPU 620 from the transceiver 610 includes a command to start the displaying of images by the video screen 145 of the AlwaysHome display 630, the CPU 620 commands the video screen 145 of the AlwaysHome display 630 to start displaying images, and the video screen 145 of the AlwaysHome display 630 starts displaying images.

**[00125]** When the data received by the CPU 620 from the transceiver 610 includes a command to stop the playing of audio by the speaker 150 of the AlwaysHome display

630, the CPU 620 commands the speaker 150 of the AlwaysHome display 630 to stop playing audio, and the speaker 150 of the AlwaysHome display 630 stops playing audio. When the data received by the CPU 620 from the transceiver 610 includes a command to start the playing of audio by the speaker 150 of the AlwaysHome display 630, the CPU 620 commands the speaker 150 of the AlwaysHome display 630 to start playing audio, and the speaker 150 of the AlwaysHome display 630 starts playing audio.

**[00126]** The high bandwidth connections 650 do not require a certain amount of bandwidth other than sufficient bandwidth to transmit the data required to be transmitted.

**[00127]** In other embodiments, the security module 135 is connected to a generally continuous power source, such as a common household 120 volt alternating current power source. The generally continuous power source may power all components of the security module 135 requiring power, eliminating the need for the battery 640. The generally continuous power source may alternately power one or more of the components of the security module 135 requiring power, while the remainder of the components of the security module 135 requiring power remain powered by the battery 640. The generally continuous power source may alternately provide power to one or more of the components of the security module 135 requiring power, while the battery 640 provides a backup power source in the event of a power interruption from the generally continuous power source. The generally continuous power source may include a ground fault interrupter.

**[00128]** In other embodiments, the security module 135 is connected to a solar power source. The solar power source may power all components of the security module

135 requiring power, eliminating the need for the battery 640. The solar power source may alternately power one or more of the components of the security module 135 requiring power, while the remainder of the components of the security module 135 requiring power remain powered by the battery 640. The solar power source may alternately provide power to one or more of the components of the security module 135 requiring power, while the battery 640 provides a backup power source in the event of a power interruption from the solar power source. Alternately, the solar power source may provide power to charge the battery 640, with the battery 640 still powering the components of the security module 135.

**[00129]** In another embodiment, the door actuator 660 is powered by a different power source than the battery 640. This may be beneficial when the door actuator 660 has significant power requirements that would make the door actuator 660 not powerable by the battery 640 or that would make the battery 640 discharge at a faster than desired rate.

**[00130]** In another embodiment, the door actuator 660 operates a gate between an open and a closed state, rather than operating the door 180 between an open and a closed state.

**[00131]** In another embodiment, the lock actuator 160 may use any method capable of alternating the door lock 185 of the door 180 between a locked and an unlocked state. For example, the lock actuator 160 may be an electromechanical actuator including a motor, rather than the lock actuator 160 being a magnetic solenoid.

**[00132]** In another embodiment, the door lock 185 of the door 180 is a magnetic door lock, wherein the door 180 is held in the closed state by a magnetic force. The lock actuator 160 is an electrical relay that operates to either provide power or not provide power to the door lock 185 of the door 180. When power is provided to the door lock 185 of the door 180, the magnetic force is created, holding the door 180 in the closed state. When power is not provided to the door lock 185 of the door 180, the magnetic force is not created, and the door 180 is not held in the closed state.

**[00133]** In another embodiment, there is no AlwaysHome display 630. The presence detector 140, camera 155, microphone 160, video screen 145, and speaker 150 are each individually electrically connected to the CPU 620 and to the battery 640. The security module 135 operates as previously described, except that each of the presence detector 140, camera 155, microphone 160, video screen 145, and speaker 150 individually communicates with the CPU 620, rather than having an AlwaysHome display acting as a "bridge" for communications between each component and the CPU 620.

**[00134]** In other embodiments, one or more of the components of the AlwaysHome display 630 is removed from the AlwaysHome display 630 and individually electrically connected to the CPU 620 and to the battery 640. For example, the camera 155 may be removed from the AlwaysHome display 630 and mounted above the door 180. As another example, the video screen 145 may be removed from the AlwaysHome display 630 and mounted to a building, to a substantially immovable object, such as a pedestal near the door 180, or directly to the door 180.

**[00135]** In another embodiment, the camera 155 of the AlwaysHome display 630 determines images prior to the presence detector 140 being operated. Additionally, the microphone 160 of the AlwaysHome display 630 determines audio prior to the presence detector 140 being operated. The images from the camera 155 of the AlwaysHome display 630 and the audio from the microphone 160 of the AlwaysHome display 630 are also sent to the personal computer 130 from the security module 135 prior to the presence detector 140 being operated. When the presence detector 140 is operated, data is sent from the CPU 620 to the transceiver 610 and then from the transceiver 610 to the transceiver 405 of the personal computer 130, the data including a command to initiate the VOIP teleconference connection 190 between the personal computer 130 and the controller 105. Upon receiving data including a command to initiate the VOIP teleconference connection 190 between the personal computer 130 and the controller 105, the personal computer 130 initiates the VOIP teleconference connection 190 between the personal computer 130 and the controller 105 (as shown in Figure 4). One benefit of this embodiment is that a third person near the personal computer 130 may view the images from the camera 155 of the AlwaysHome display 630 and listen to the audio from the microphone 160 of the AlwaysHome display 630 at any time, even when the first person is not present near the door 180. Then, when the first person's presence at the door 180 is detected by the presence detector 140 of the AlwaysHome display 630, the controller 105 will be connected to the personal computer 130, allowing the second person to also view the images from the camera 155 of the AlwaysHome display 630 and to listen to the audio from the microphone 160 of the AlwaysHome display 630.

Break up

**[00136]** In other embodiments, the presence detector 140 of the AlwaysHome display 630 may be other than a doorbell. For example, the presence detector 140 may be a mechanical switch operable by the first person, a motion detector detecting motion of the first person, a system analyzing images determined by the camera 155 of the security module 135 to detect the presence of the first person, a thermal detector detecting the first person's body heat, or a vibration detector detecting the vibrations created by the first person's impacting the door 180 with a fist.

**[00137]** In another embodiment, the presence detector 140 is a radio system having a radio receiver and a radio transmitter. The radio transmitter is in the possession of the first person. The presence of the first person is detected when the radio receiver detects a radio transmission from the radio transmitter.

**[00138]** In another embodiment, the presence detector 140 is a calculating system having a first set of geographic coordinates and a second set of geographic coordinates. The first set of geographic coordinates represents a geographic location of the first person. The second set of geographic coordinates represents the location at which the first person is to be detected. The calculating system calculates the distance between the first set of geographic coordinates and the second set of geographic coordinates and detects the presence of the first person if the calculated distance is within a predetermined range.

**[00139]** In another embodiment, the door status detector 165 detects a piece of metal attached to the door frame generally surrounding the door 180 rather than detecting a magnet attached to the door frame generally surround the door 180.

**[00140]** In other embodiments, the door status detector 165 may be any device suitable for detecting whether the door 180 is in an open or closed state. For example, the door status detector 165 may be an optical detector that detects whether a part of the door frame generally surrounding the door 180 is near the optical detector or not. As another example, the door status detector 165 may be a mechanical switch, wherein the mechanical switch has an open and a closed state, and the state of the mechanical switch alternates from open to closed or closed to open as the state of the door 180 is alternated from open to closed or closed to open.

**[00141]** In another embodiment, the door status detector 165 is not connected to the battery 640. This may be useful, for example, when the door status detector 165 appears to the CPU 620 as an open or closed electrical connection and the CPU 620 detects whether the electrical connection is open or closed.

**[00142]** In other embodiments, the door actuator 660 is not an electromechanical actuator. The door actuator 660 may be any device suitable for alternating a door or a gate between an open and a closed state. For example, the door actuator 660 may be a pneumatic actuator or a hydraulic actuator.

**[00143]** In another embodiment, the security module 135 includes a lock status detector electrically connected to the CPU 620 and the battery 640. The lock status detector performs the detection of whether the door lock 185 of the door 180 is locked or unlocked, instead of the lock actuator 160 performing the detection of whether the door lock 185 of the door 180 is locked or unlocked.

**[00144]** In another embodiment, images from the camera 155 of the AlwaysHome display 630 are not compressed prior to being sent from the CPU 620 to the transceiver 610.

**[00145]** In other embodiments, the CPU 620 may compress images from the camera 155 of the AlwaysHome display 630 using any compression method suitable for sending images to the personal computer 130 within bandwidth limitations of the high-bandwidth connections 650. For example, the CPU 620 may compress images from the camera 155 of the AlwaysHome display 630 using MPEG-4 or Xvid.

**[00146]** In another embodiment, a transmitter and a receiver, each electrically connected to the CPU 620 and to the battery 640, replace the transceiver 610. The transmitter transmits the data from the CPU 620 through the Bluetooth wireless connection 195 that the transceiver 610 would otherwise transmit. The receiver receives the data from the personal computer 130 through the Bluetooth wireless connection 195 that the transceiver 610 would otherwise receive.

**[00147]** Figure 7 illustrates a side view of a security module 700 according to an embodiment of the present invention. In the present embodiment, the security module 700 is shaped to fit into a standard size door opening, replacing standard door hardware, such as a lock and doorknobs. The security module 700 includes an interior unit 710, an exterior unit 720, a power wire 730, and a signal wire 732. The interior unit 710 includes a latch side 712 and a top side 714. The interior unit 710 also includes an interior doorknob 715, a transceiver 610, and a door status detector 165. The interior unit 710 also includes a CPU 620, a lock actuator 160, and a battery 640 (not shown in Figure 7).

The battery 640 is preferably a battery pack with four standard size AA batteries. The exterior unit 720 includes a latch side 722 and a top side 724. The exterior unit 720 also includes an exterior doorknob 725 and an AlwaysHome display 630.

**[00148]** Figure 7 also illustrates a side view of the door 180 according to an embodiment of the present invention. The door 180 includes an interior side 735, an exterior side 740, and a latch side 745. The door 180 also includes a latch 750 and a latch plate 755.

**[00149]** The latch 750 of the door 180 protrudes from the latch side 745 of the door 180 and may be operated to reciprocate along an axis substantially perpendicular to the latch side 745 of the door 180. The latch plate 755 of the door 180 is physically attached to the latch side 745 of the door 180, the latch plate 755 of the door 180 having a hole through which the latch 750 of the door 180 may protrude.

**[00150]** The interior unit 710 abuts the interior side 735 of the door 180. The exterior unit 720 abuts the exterior side 740 of the door 180. A threaded connection between the interior unit 710 and the exterior unit 720 produces a force that tends to pull the interior unit 710 toward the exterior unit 720 and the exterior unit 720 toward the interior unit 710, causing the interior unit 710 to remain abutted against the interior side 735 of the door 180 and the exterior unit 720 to remain abutted against the exterior side 740 of the door 180. The interior unit 710 is positioned with the latch side 712 of the interior unit 710 substantially parallel to the latch side 745 of the door 180, and a surface normal of the latch side 712 of the interior unit 710 pointing in substantially the same direction as a surface normal of the latch side 745 of the door 180. The exterior unit 720

is positioned with the latch side 722 of the exterior unit 720 substantially parallel to the latch side 745 of the door 180, and a surface normal of the latch side 722 of the exterior unit 720 pointing in substantially the same direction as a surface normal of the latch side 745 of the door 180.

**[00151]** The interior doorknob 715 of the interior unit 710 is positioned in the interior unit 710 to rotate about an axis substantially perpendicular to the interior side 735 of the door 180. The interior doorknob 715 of the interior unit 710 is mechanically connected to the latch 750 of the door 180 and to the door lock 185 of the door 180. The exterior doorknob 725 of the exterior unit 720 is positioned in the exterior unit 720 to rotate about an axis substantially perpendicular to the exterior side 740 of the door 180. The exterior doorknob 725 of the exterior unit 720 is mechanically connected to the latch 750 of the door 180 and to the door lock 185 of the door 180.

**[00152]** The transceiver 610 of the interior unit 710 is positioned on the top side 714 of the interior unit 710. The transceiver 610 of the interior unit 710 is electrically connected to the CPU 620 of the interior unit 710 (as shown in Figure 6). The door status detector 165 of the interior unit 710 is positioned on the latch side 712 of the interior unit 710. The door status detector 165 is electrically connected to the CPU 620 of the interior unit 710 and to the battery 640 of the interior unit 710 (as shown in Figure 6).

**[00153]** The AlwaysHome display 630 of the exterior unit 720 is positioned near the top side 724 of the exterior unit 720 and positioned at an angle such that a surface normal of the AlwaysHome display 630 of the exterior unit 720 points away from the exterior side 740 of the door 180 at approximately a 45 degree angle from the exterior

side 740 of the door 180 and points away from the doorknob 725 of the exterior unit 720 at approximately a forty-five degree angle from the axis about which the doorknob 725 of the exterior unit 720 rotates. The AlwaysHome display 630 of the exterior unit 720 is electrically connected to the CPU 620 of the interior unit 710 through the signal wire 732 and to the battery 640 of the interior unit 710 through the power wire 730.

**[00154]** The interior unit 710 is electrically connected to the exterior unit 720 through the power wire 730. The interior unit 710 is also electrically connected to the exterior unit 720 through the signal wire 732.

**[00155]** In operation, the battery 640 of the interior unit 710 provides power to the AlwaysHome display 630 of the exterior unit 720 through the power wire 730 (as shown in Figure 6). The battery 640 of the interior unit 710 also provides power to the CPU 620 of the interior unit 710, the transceiver 650 of the interior unit 710, the door status detector 165 of the interior unit 710, and the lock actuator 160 of the interior unit 710 (as shown in Figure 6). The signal wire 732 provides the connection between the CPU 620 of the interior unit 710 and the AlwaysHome display 630 of the exterior unit 720 for sending data between the CPU 620 of the interior unit 710 and the AlwaysHome display 630 of the exterior unit (as shown in Figure 6).

**[00156]** When the door lock 185 of the door 180 is in the unlocked state, rotating the interior doorknob 715 of the interior unit 710 or the exterior doorknob 725 of the exterior unit 720 operates the latch 750 of the door 180 between a latched and an unlatched state. When the door lock 185 of the door 180 is in the locked state, rotating the interior doorknob 715 of the interior unit 710 or the exterior doorknob 725 of the

exterior unit 720 does not operates the latch 750 of the door 180 between the latched and unlatched states. When the latch 750 of the door 180 is in the latched state, the door 180, upon being positioned in the closed state, is held in the closed state by the latch 750 of the door 180. When the latch 750 of the door 180 is in the unlatched state, the door 180, upon being positioned in the closed state, is not held in the closed state by the latch 750 of the door 180.

**[00157]** The AlwaysHome display 630 of the exterior unit 720 is positioned to be visible to and operable by the first person.

**[00158]** In another embodiment, when the door lock 185 of the door 180 is in the locked state, the lock actuator 160 of the interior unit 710 substantially stops the exterior doorknob 725 of the exterior unit 720 from being rotatable.

**[00159]** In other embodiments, the elements of the security module 700 can be distributed among the interior unit 710 and the exterior unit 720 in any manner suitable for interaction with the AlwaysHome display 630 by the first person and communication with the personal computer 130 by the transceiver 610.

**[00160]** In other embodiments, the security module 700 may include more or less units than the interior unit 710 and the exterior unit 720. The elements of the security module 700 may be distributed amongst any number of units as long as the AlwaysHome display 630 is positioned suitably for interaction with the first person and the transceiver 610 is positioned suitably for communication with the personal computer 130.

**[00161]** In another embodiment, the interior unit 710 and the exterior unit 720 attach to the door 180 using screws or any other suitable fastener.

**[00162]** In another embodiment, the transceiver 610 of the interior unit 710 may be positioned anywhere suitable for communication with the personal computer 130.

**[00163]** In another embodiment, the door status detector 165 of the interior unit 710 may be positioned anywhere suitable for detecting the status of the door 180.

**[00164]** In another embodiment, the AlwaysHome display 630 of the exterior unit 720 may be positioned anywhere suitable for interaction with the first person.

**[00165]** In another embodiment, the exterior unit 720 includes a battery for providing power to the AlwaysHome display 630, and there is no power wire 730.

**[00166]** In another embodiment, the interior unit 710 includes a second transceiver electrically connected to the CPU 620 of the interior unit 710, the exterior unit 720 includes a third transceiver electrically connected to the AlwaysHome display 630 of the exterior unit 720. Data passes between the CPU 620 of the interior unit 710 and the AlwaysHome display 630 of the exterior unit 720 by using radio communication between the second transceiver and third transceiver. There is no signal wire 732.

**[00167]** In another embodiment, the interior unit 710 includes a low battery indicator. The low battery indicator may be a light emitting diode operable to emit light. The CPU 620 of the interior unit 710 monitors the voltage level of the battery 640 of the interior unit 710 and operates the low battery indicator when the voltage level of the battery 640 of the interior unit 710 drops below a predetermined level, such as 4.8 volts.

**[00168]** In another embodiment, the CPU 620 of the interior unit 710 monitors the voltage level of the battery 640 of the interior unit 710. The CPU 620 of interior unit 710 sends data to the transceiver 610, the data including the voltage level of the battery 640 of interior unit 710. The transceiver 610 then sends this data to the personal computer 130 for display to a user through the computer monitor 435 of the personal computer 130.

**[00169]** In another embodiment, the interior unit 710 includes a second AlwaysHome display, in addition to the first AlwaysHome display 630 included in the exterior unit 720. Through the second AlwaysHome display, the second person can interact with the first person through video and audio communication without the second person having to use the controller 105 or the personal computer 130. For example, if the first person activates the presence detector 140 of the AlwaysHome display 630 of the exterior unit 720, and the second person is near the interior side 735 of the door 180, then it may be easier for the second person to communicate with the first person through the interior unit 710 rather than using the personal computer 130 or the controller 105. Additionally, communicating with the first person through the interior unit 710 may save the second person money when using the controller 105 adds charges to a telephone bill.

**[00170]** Figure 8 illustrates a method for transmitting data 800 in a system for video communication according to an embodiment of the present invention. The method for transmitting data 800 includes a first step 805, a second step 810, a decision 815, a third step 820, a fourth step 825, a fifth step 830, a sixth step 835, a seventh step 840, an eighth step 845, a ninth step 850, a tenth step 855, an eleventh step 860, a twelfth step 865, a thirteenth step 870, and a fourteenth step 875.

**[00171]** In the method for transmitting data 800, the first step 805 is to detect the presence of a person. The person may be the first person (as shown in Figure 1). The person's presence is detected by a presence detector, such as the presence detector 140 of the AlwaysHome display 630 of the security module 135 (as shown in Figure 6). The second step 810 is to send a request to a personal computer to initiate a call. The request is sent by a security module, such as the security module 135 (as shown in Figure 1). The request is sent by the security module to a personal computer, such as the personal computer 130 (as shown in Figure 1). The decision 815 is whether or not the call is answered. A controller, such as the controller 105 (as shown in Figure 1), answers the call or does not answer the call.

**[00172]** If the controller does not answer the call at decision 815, the method proceeds to the third step 820. The third step 820 is to determine audio and video. The audio is determined by a microphone, such as the microphone 160 of the AlwaysHome display 630 of the security module 135 (as shown in Figure 6). The video is determined by a camera, such as the camera 155 of the AlwaysHome display 630 of the security module 135 (as shown in Figure 6). Next, the fourth step 825 is to compress the video. The security module compresses the video with a CPU, such as the CPU 620 of the security module 135 (as shown in Figure 6). The fifth step 830 is to send data including the audio and video to the personal computer. The security module sends data including the determined audio and video to the personal computer for the recording of a voicemail message.

**[00173]** If the controller does answer the call at decision 815, the method proceeds from the second step 810 to the sixth step 835. The sixth step 835 is to determine audio and video. The audio is determined by a microphone, such as the microphone 160 of the AlwaysHome display 630 of the security module 135 (as shown in Figure 6). The video is determined by a camera, such as the camera 155 of the AlwaysHome display 630 of the security module 135 (as shown in Figure 6). Next, the seventh step 840 is to compress the video. The security module compresses the video with a CPU, such as the CPU 620 of the security module 135 (as shown in Figure 6). The eighth step 845 is to determine the status of a door lock. A lock actuator, such as the lock actuator 160 of the security module 135 (as shown in Figure 6), determines whether a door lock, such as the door lock 185 of the door 180 (as shown in Figure 1), is in a locked state or an unlocked state. The ninth step 850 is to determine the status of a door. A door status detector, such as the door status detector 165 of the security module 135 (as shown in Figure 6), determines whether a door, such as the door 180 (as shown in Figure 1), is in an open state or a closed state. The tenth step 855 is to send data including the audio, video, door lock status, and door status to the personal computer. The security module sends the data to the personal computer for forwarding to a controller, such as the controller 105 (as shown in Figure 2).

**[00174]** The eleventh step 860 is to receive data including audio, video, and commands from the personal computer. The security module receives the data from the personal computer. The data may originate from the controller and is forwarded through the personal computer to the security module. Next, the twelfth step 865 is to output the

audio and video in the data from the personal computer. The security module outputs the audio and video in the data from the personal computer. The audio is played through a speaker, such as the speaker 150 of the AlwaysHome display 630 of the security module 135 (as shown in Figure 6). The video is displayed on a video screen, such as the video screen 145 of the AlwaysHome display 630 of the security module 135 (as shown in Figure 6).

**[00175]** Next, the thirteenth step 870 is to operate a lock actuator in response to a command in the data from the personal computer. The security module operates a lock actuator, such as the lock actuator 160 of the security module 135 (as shown in Figure 6), to operate a lock, such as the door lock 185 of the door 180 (as shown in Figure 1). The fourteenth step 875 is to operate a door actuator in response to a command in the data from the personal computer. The security module operates a door actuator, such as the door actuator 660 of the security module 135 (as shown in Figure 6), to operate a door, such as the door 180 (as shown in Figure 1).

**[00176]** In another embodiment, the third step 820 is to determine only audio, rather than audio and video. The fourth step 825 is skipped. The fifth step 830 is to send data including audio, but not video, to the personal computer.

**[00177]** In another embodiment, in the eleventh step 860, the data originates from the person computer rather than the controller.

**[00178]** Figure 9 illustrates a method for video communication 900 according to an embodiment of the present invention. The method for video communication 900 includes a first step 910 and a second step 920.

**[00179]** In the method for video communication 900, the first step 910 is to detect the presence of a first person at a location. The location is a door, such as the door 180 (as shown in Figure 1). The presence of the first person at the location is detected by a presence detector, such as the presence detector 140 of the security module 135 (as shown in Figure 6).

**[00180]** The second step 920 is to establish an electronic video communication link between the first person and a second person, wherein images of the second person are displayed to the first person. The electronic video communication link determines images of the second person and displays the images of the second person to the first person. The images of the second person are determined by a camera, such as the camera 120 of the controller 105 (as shown in Figure 2). The images of the second person are displayed to the first person by a video screen, such as the video screen 145 of the security module 135 (as shown in Figure 6). The images of the second person are transmitted from the camera to the video screen by a process such as the process shown in Figure 1 to transmit data from the camera 120 of the controller 105 to the video screen 145 of the security module 135.

**[00181]** In other embodiments, the presence of the first person may be detected at a location other than a door (as shown in Figure 1).

**[00182]** In other embodiments, the presence detector may take various forms, such as a doorbell or a motion detector (as shown in Figure 6).

**[00183]** Figure 10 illustrates a method for video communication 1000 according to an embodiment of the present invention. The method for video communication 1000 includes a first step 1010, a second step 1020, and a third step 1030.

**[00184]** In the method for video communication 1000, the first step 1010 is to detect the presence of a first person at a location. The location is a door, such as the door 180 (as shown in Figure 1). The presence of the first person at the location is detected by a presence detector, such as the presence detector 140 of the security module 135 (as shown in Figure 6).

**[00185]** The second step 1020 is to request permission to display images of the second person to the first person. Permission may be requested in various ways, as shown in Figure 1.

**[00186]** The third step 1030 is to establish an electronic video communication link between the first person and the second person, wherein images of the second person are displayed to the first person. The electronic video communication link determines images of the second person and displays the images of the second person to the first person. The images of the second person are determined by a camera, such as the camera 120 of the controller 105 (as shown in Figure 2). The images of the second person are displayed to the first person by a video screen, such as the video screen 145 of the security module 135 (as shown in Figure 6). The images of the second person are

transmitted from the camera to the video screen by a process such as the process shown in Figure 1 to transmit data from the camera 120 of the controller 105 to the video screen 145 of the security module 135.

**[00187]** In other embodiments, the presence of the first person may be detected at a location other than a door (as shown in Figure 1).

**[00188]** In other embodiments, the presence detector may take various forms, such as a doorbell or a motion detector (as shown in Figure 6).

**[00189]** Figure 11 illustrates a method for transmitting data 1100 in a system for video communication according to an embodiment of the present invention. The method for transmitting data 1100 includes a first step 1105, a decision 1110, a second step 1115, a third step 1120, a fourth step 1125, a fifth step 1130, a sixth step 1135, a seventh step 1140, and an eighth step 1145.

**[00190]** In the method for transmitting data 1100, the first step 1105 is to receive a call from a personal computer. The personal computer may be the personal computer 130 (as shown in Figure 4). A controller, such as the controller 105 (as shown in Figure 2), receives the call from the personal computer. The decision 1110 is whether to answer the call. The controller gives a person, such as the second person (as shown in Figure 1), the option to answer the call or to not answer the call.

**[00191]** If the person declines to answer the call at decision 1110, the method proceeds to the second step 1115. The second step 1115 is to send the call to voicemail.

The controller sends the call to voicemail, so that the call from the personal computer may leave a voicemail message on the controller's voicemail system.

**[00192]** If the person decides to answer the call at decision 1110, the method proceeds from the first step 1105 to the third step 1120. The third step 1120 is to receive data from the personal computer. The controller receives the data from the personal computer. The data may contain audio, video, lock status information, and door status information (as shown in Figure 6). Next, the fourth step 1125 is to output the data from the personal computer. The controller outputs the data from the personal computer. The controller displays video, lock status information, and door status information in the data on an interactive video display, such as the interactive video display 110 of the controller 105 (as shown in Figure 2). The controller plays audio in the data through a speaker, such as the speaker 115 of the controller 105 (as shown in Figure 2).

**[00193]** Next, the fifth step 1130 is to accept commands. The controller accepts commands from the person. The commands may be for the personal computer or for a security module, such as the security module 135 (as shown in Figure 6). The sixth step 1135 is to determine audio and video. The controller determines audio and video of the person, such as with the microphone 125 of the controller 105 (as shown in Figure 2) and the camera 120 of the controller 105 (as shown in Figure 2). The seventh step 1140 is to compress the video. The controller compresses the video with a CPU, such as the CPU 250 of the controller 105 (as shown in Figure 2). The eighth step 1145 is to transmit data including the audio, video, and commands to the personal computer. The controller transmits the data to the personal computer.

**[00194]** In another embodiment, sending the call to voicemail at the second step 1115 directs the call to leave a voicemail message on the personal computer, rather than on the controller's voicemail system.

**[00195]** In other embodiments, in the fourth step 1125, the video, lock status information, and door status information may be displayed on devices other than an interactive video display. For example, the video may be displayed on a discreet video screen, and the status information may be displayed by operating light-emitting diodes.

**[00196]** Figure 12 illustrates a method for controlling a security system 1200 according to an embodiment of the present invention. The method for controlling a security system 1200 includes a first step 1210, a second step 1220, a third step 1230, a fourth step 1240, a fifth step 1250, a sixth step 1260, and a seventh step 1270.

**[00197]** In the method for controlling a security system 1200, the first step 1210 is to monitor a security parameter. The security parameter is the state of a lock, such as the state of the door lock 185 of the door 180 (as shown in Figure 1). The security parameter is monitored by a lock actuator, such as the lock actuator 160 of the security module 135 (as shown in Figure 6), in a building automation and security system, such as the security module 135 (as shown in Figure 6).

**[00198]** The second step 1220 is to authenticate a controller. The controller is a controller to interact with the building automation and security system, such as the controller 105 (as shown in Figure 2). The controller is authenticated by initiating a connection to the controller using an authorized device address. The authorized device

address is a telephone number associated with the controller. The building automation and security system authenticates the controller by commanding a telephone call be placed to the controller using the authorized device address.

**[00199]** Next, the third step 1230 is to transmit the status of the security parameter. The building automation and security system sends the status of the security parameter to the authenticated controller. The fourth step 1240 is to display the status of the security parameter. The controller displays the status of the security parameter on an interactive video display, such as the interactive video display 110 of the controller 105 (as shown in Figure 2).

**[00200]** Next, the fifth step 1250 is to enter a command on the controller. The command is for the building automation and security system to perform a building automation action. The building automation action is to operate a door lock, such as the door lock 185 of the door 180 (as shown in Figure 1). The sixth step 1260 is to transmit the command. The command is transmitted from the controller to the building automation and security system. The seventh step 1270 is to perform a building automation action. The building automation and security system performs the building automation action, operating a door lock, as commanded by the controller.

**[00201]** In other embodiments, the security parameter can be other than the status of a door lock. For example, the security parameter may be whether the state of a door is open or closed, whether window blinds are open or closed, or whether a light is on or off.

**[00202]** In other embodiments, the authorized device address can be any identifier usable to connect the building automation and security system to the controller. For example, the authorized device address may be an internet address or a radio frequency.

**[00203]** In other embodiments, the controller may display the status of the security parameter using a device other than an interactive video display. For example, the controller may operate a light-emitting diode to represent the status of the security parameter.

**[00204]** In other embodiments, the building automation action can be an action other than operating a lock. For example, the building automation action may be operating a door between an open state and a closed state or operating a light between an on state and an off state.

**[00205]** [Validate invention – [**chose to not do this section yet**] remind the reader of the shortcomings of the prior art that you pointed out in the Background section and explicitly explain how your invention corrects the defects in the prior art]

**[00206]** While particular elements, embodiments, and applications of the present invention have been shown and described, it is understood that the invention is not limited thereto because modifications may be made by those skilled in the art, particularly in light of the foregoing teaching. It is therefore contemplated by the appended claims to cover such modifications and incorporate those features which come within the spirit and scope of the invention.

CLAIMS

The invention claimed is:

1. A method for video communication, said method including:

detecting with a presence detector the presence of a first person at a location; and

establishing an electronic video communication link between said first person and a second person, wherein images of said second person are displayed to said first person.

interesting. May need more to IS claim, but tight, focused claim.

2. The method of claim 1, further including:

requesting permission from said second person to display said images of said second person to said first person prior to displaying said images of said second person to said first person.

3. The method of claim 2, wherein said permission is requested from said second person by initiating a call to said second person.

4. The method of claim 1, wherein said second person selectively stops said images of said second person from being displayed to said first person.

5. The method of claim 1, wherein said location is an entrance to a building.

6. The method of claim 1, wherein said location is an entrance to a room.

7. The method of claim 1, wherein said location is defined by a set of geographic coordinates.

8. The method of claim 1, wherein said presence detector is a switch.

9. The method of claim 1, wherein said presence detector is a motion detector.

10. The method of claim 1, wherein said presence detector is a radio system, wherein a radio receiver detects a radio transmission from a radio transmitter, said radio transmitter being in the possession of said first person.

11. The method of claim 1, wherein said presence detector is a calculating system, wherein a calculated distance from a first set of geographic coordinates representing a geographic location of said first person to a second set of geographic coordinates is calculated, the presence of said first person being detected when said calculated distance is within a predetermined range.

12. A system for video communication, the system including:

a camera determining images of a first person;

a transmitter transmitting the images of the first person determined by the camera;

a receiver receiving the images of the first person from the transmitter; and

a video screen receiving the images of the first person from the receiver and displaying the images of the first person to a second person, wherein the second person is located at an exterior side of an entrance.

13. The system of claim 12, wherein the camera begins determining the images of the first person after a presence detector detects the presence of the second person at the exterior side of the entrance.

14. The system of claim 12, wherein the video screen is attached to a door.

15. The system of claim 12, wherein the video screen is attached to a building.

16. The system of claim 12, wherein the video screen is substantially immovable.

17. The system of claim 12, wherein the entrance includes a door.

18. The system of claim 12, wherein the entrance includes a gate.

19. The system of claim 12, further including:

a CPU for compressing the images of the first person before the transmitter transmits the images of the first person.

20. A system for controlling a lock, the system including:

a lock actuator controllable to alternate a building door lock between a locked state and an unlocked state; and

a receiver receiving a radio communication, wherein the receiver commands the lock actuator to change the state of the building door lock upon receiving the radio communication.

21. The system of claim 20, further including:

a transmitter transmitting the radio communication to the receiver; and

a controller commanding the transmitter to transmit the radio communication to the receiver.

22. The system of claim 21, wherein the controller is a computer.

23. The system of claim 21, wherein the controller is a telephone.

24. A system for controlling a lock, the system including:

a lock actuator controllable to alternate a lock between a locked state and an unlocked state;

a lock status detector detecting the state of the lock;

a first transceiver receiving a first radio communication and transmitting a second radio communication, wherein the first radio communication commands the lock actuator

to change the state of the lock, and the second radio communication includes the state of the lock as detected by the lock status detector;

a second transceiver transmitting the first radio communication to the first transceiver and receiving the second radio communication from the first transceiver;

a controller commanding the second transceiver to transmit the first radio communication and determining the state of the lock from the second radio communication received by the second transceiver; and

a visual indicator indicating the state of the lock as determined by the controller.

25. The system of claim 24, wherein the controller is a computer.

26. The system of claim 24, wherein the controller is a telephone.

27. The system of claim 24, wherein the lock is a building door lock.

28. The system of claim 24, wherein the lock is an automotive door lock.

29. The system of claim 24, wherein the lock limits access to a premise.

30. The system of claim 24, wherein the visual indicator is a video screen.

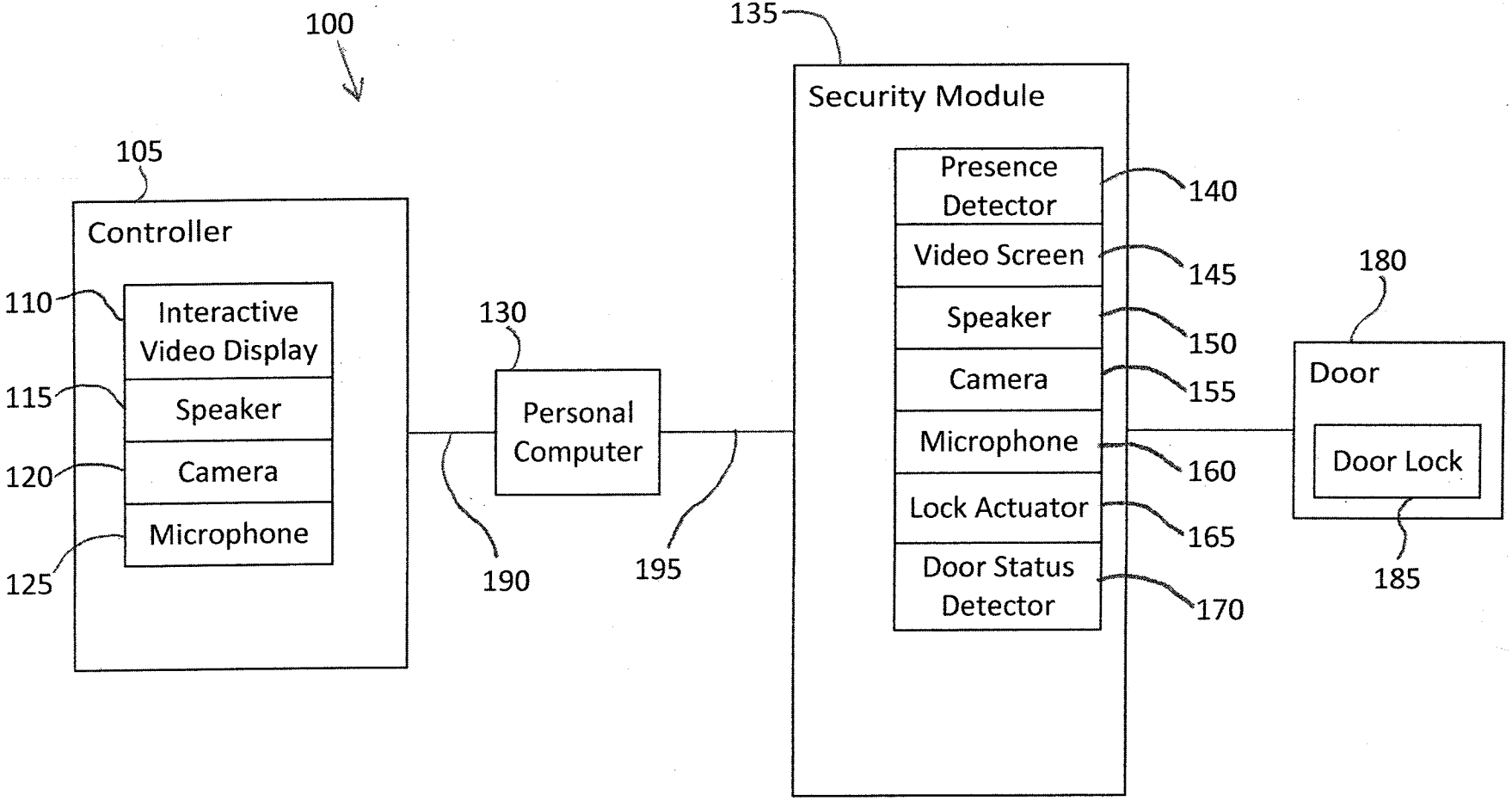

100
105
Controller
110
Interactive Video Display
115
Speaker
120
Camera
125
Microphone
130
Personal Computer
190
195
135
Security Module
Presence Detector
140
Video Screen
145
Speaker
150
Camera
155
Microphone
160
Lock Actuator
165
Door Status Detector
170
180
Door
Door Lock
185

FIG. 1

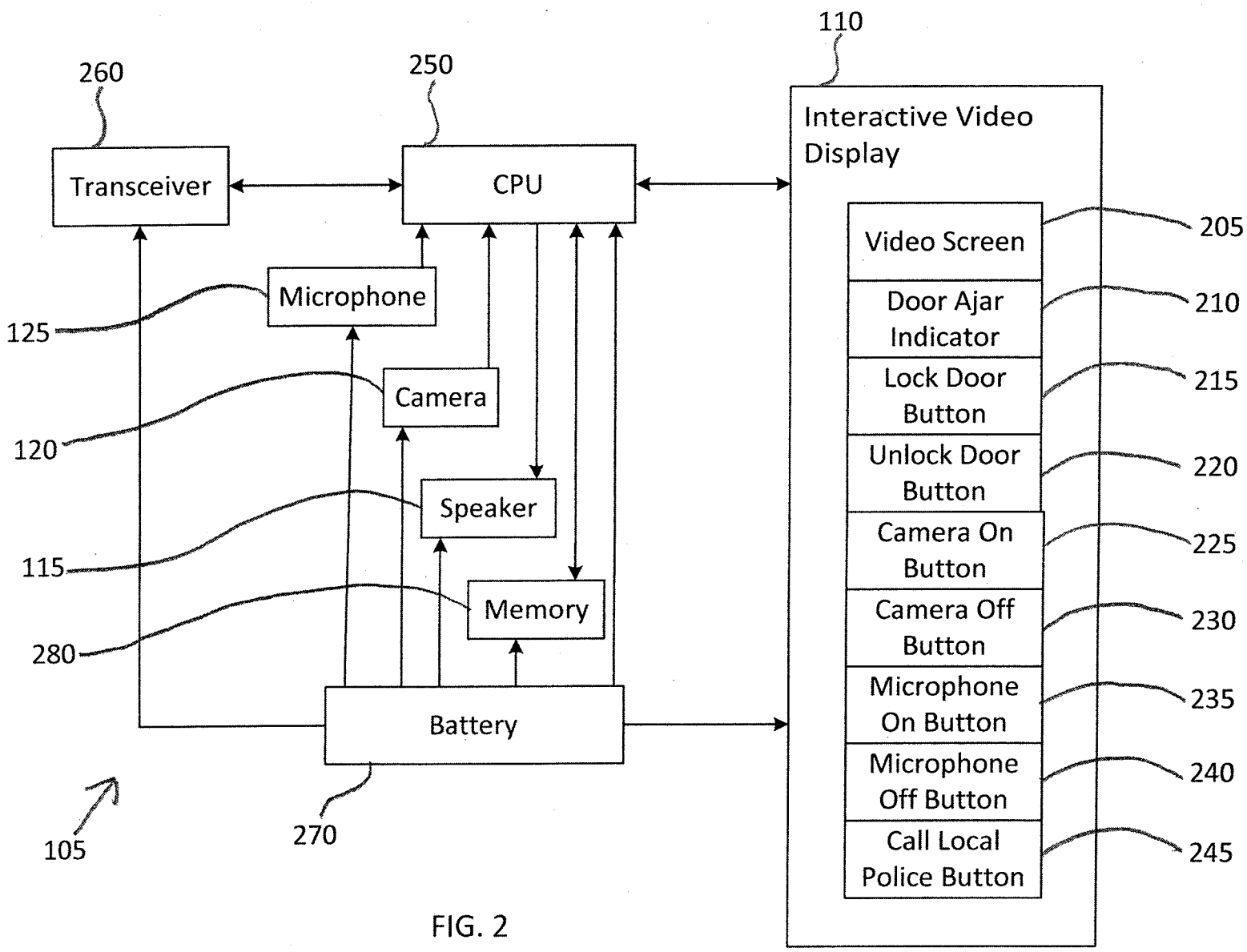

110
260
250
Transceiver
CPU
Interactive Video Display
Video Screen
205
Door Ajar Indicator
210
Lock Door Button
215
Unlock Door Button
220
Camera On Button
225
Camera Off Button
230
Microphone On Button
235
Microphone Off Button
240
Call Local Police Button
245
Microphone
125
Camera
120
Speaker
115
Memory
280
Battery
105
270

FIG. 2

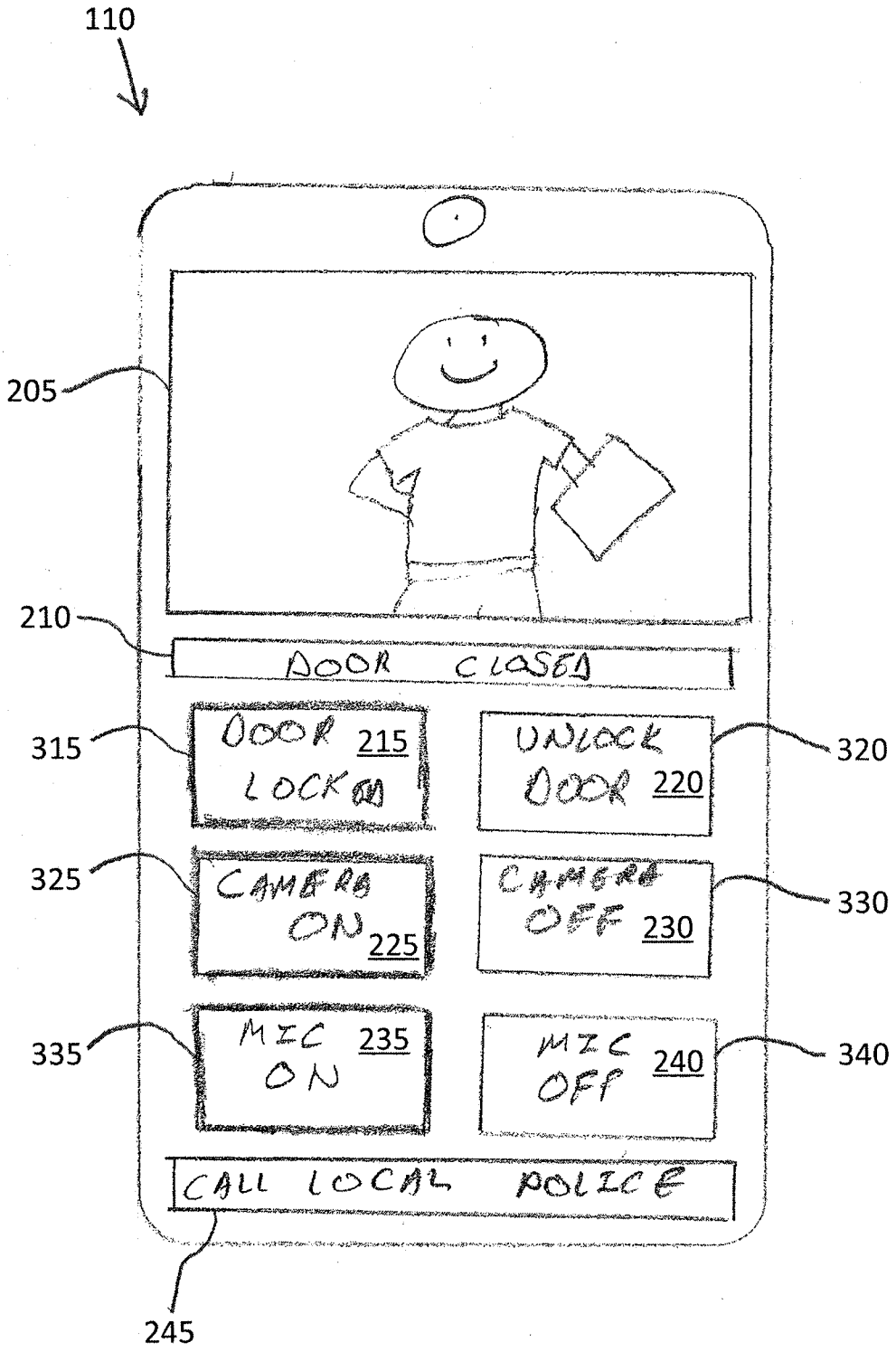

110
205
210
DOOR CLOSED
315
DOOR LOCK 215
320
UNLOCK DOOR 220
325
CAMERA ON 225
330
CAMERA OFF 230
335
MIC ON 235
340
MIC OFF 240
CALL LOCAL POLICE
245

FIG. 3

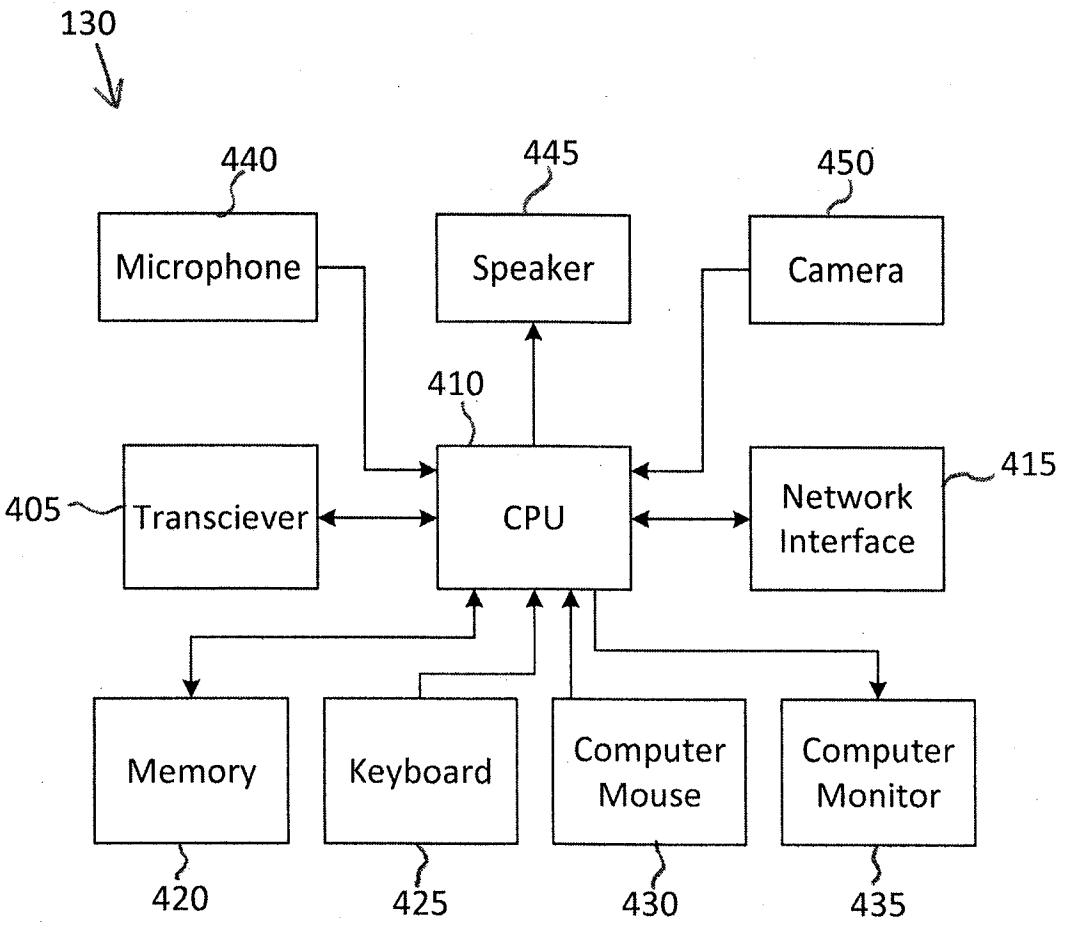

130
440
445
450
Microphone
Speaker
Camera
410
405
Transciever
CPU
Network Interface
415
Memory
Keyboard
Computer Mouse
Computer Monitor
420
425
430
435

FIG. 4

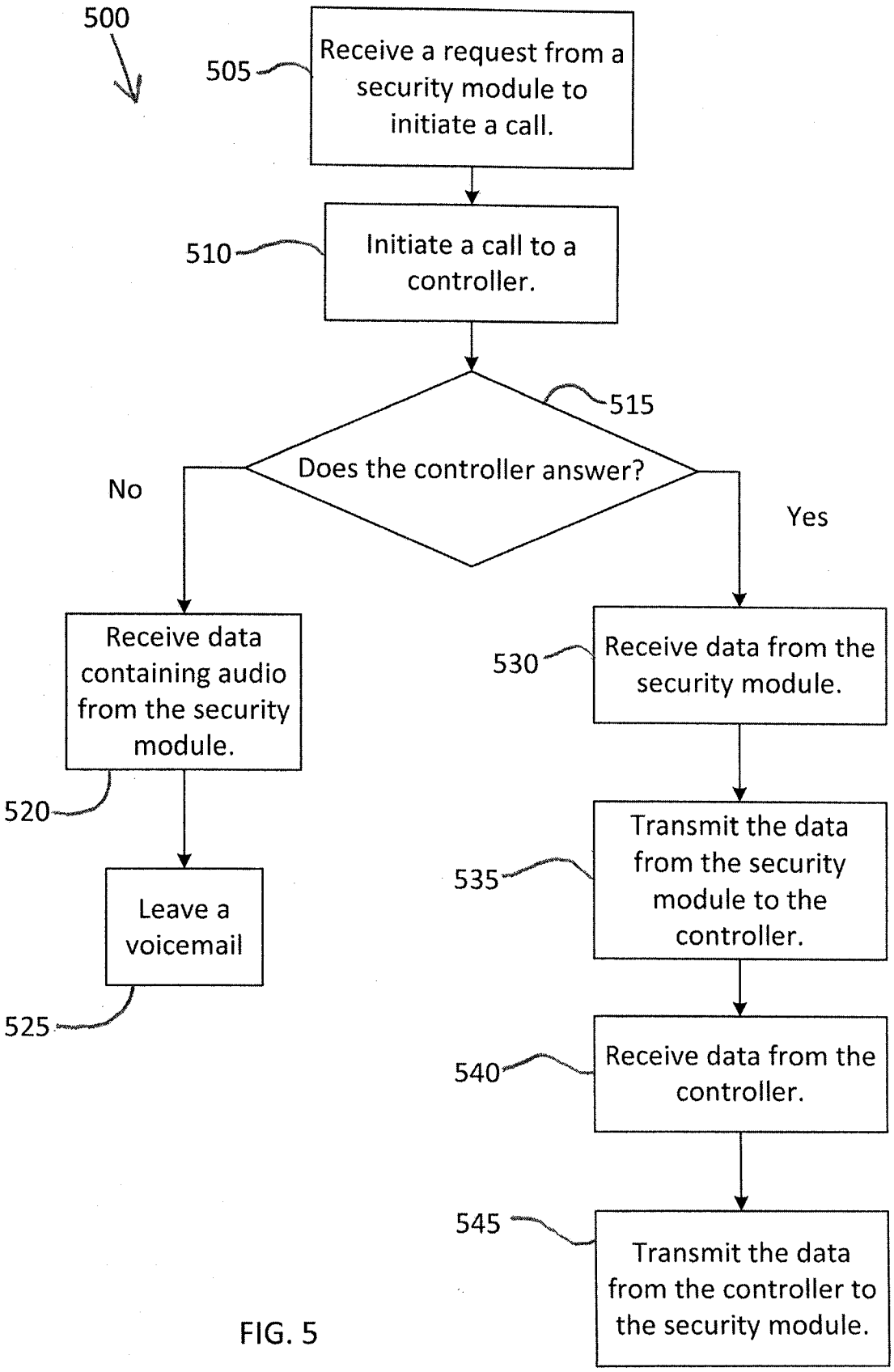

500
505
Receive a request from a security module to initiate a call.
510
Initiate a call to a controller.
515
Does the controller answer?
No
Yes
Receive data containing audio from the security module.
520
Leave a voicemail
525
530
Receive data from the security module.
535
Transmit the data from the security module to the controller.
540
Receive data from the controller.
545
Transmit the data from the controller to the security module.

FIG. 5

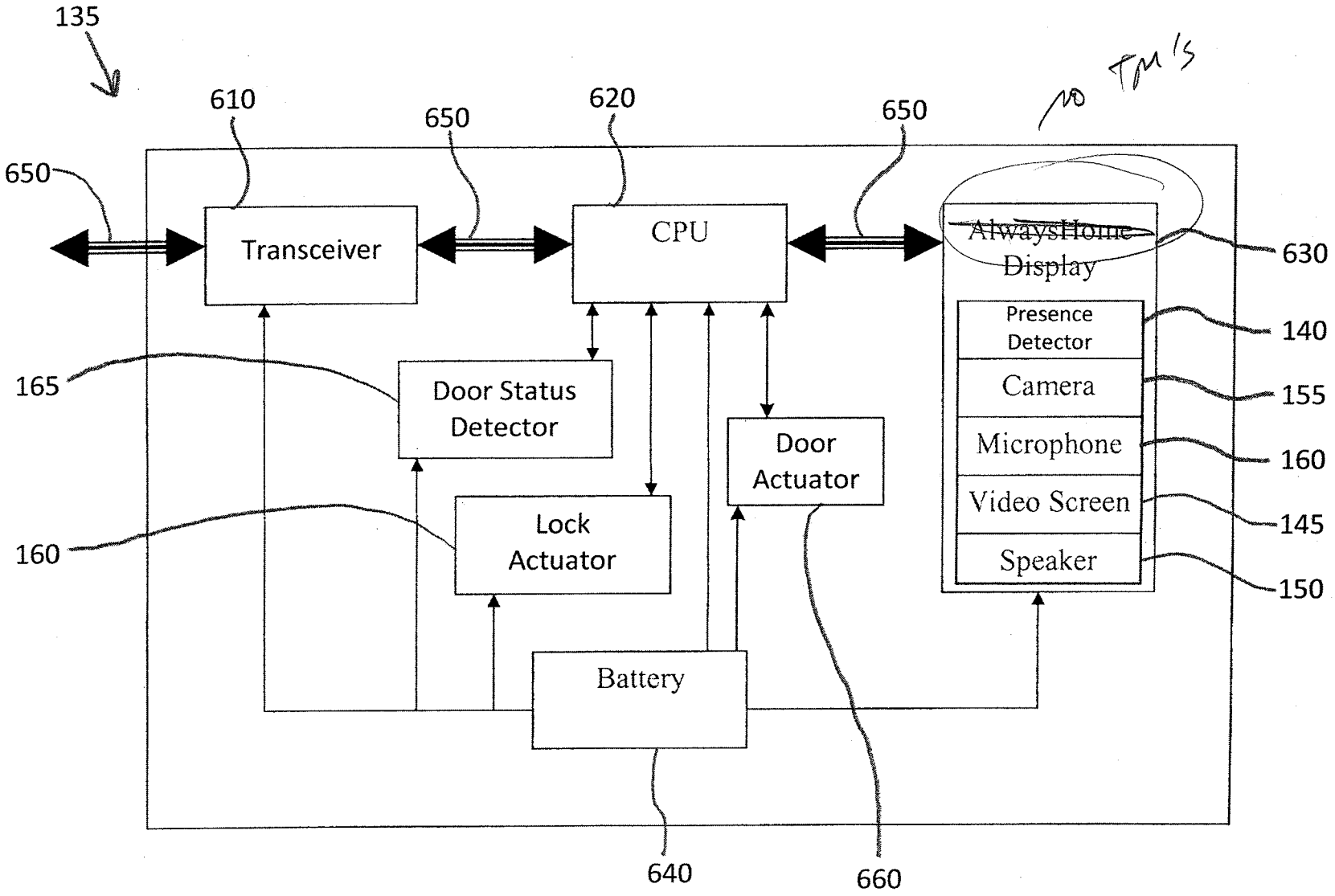

135
610
650
620
650
650
Transceiver
CPU
AlwaysHome Display
630
Presence Detector
140
Camera
155
Microphone
160
Video Screen
145
Speaker
150
165
Door Status Detector
Door Actuator
160
Lock Actuator
Battery
640
660

FIG. 6

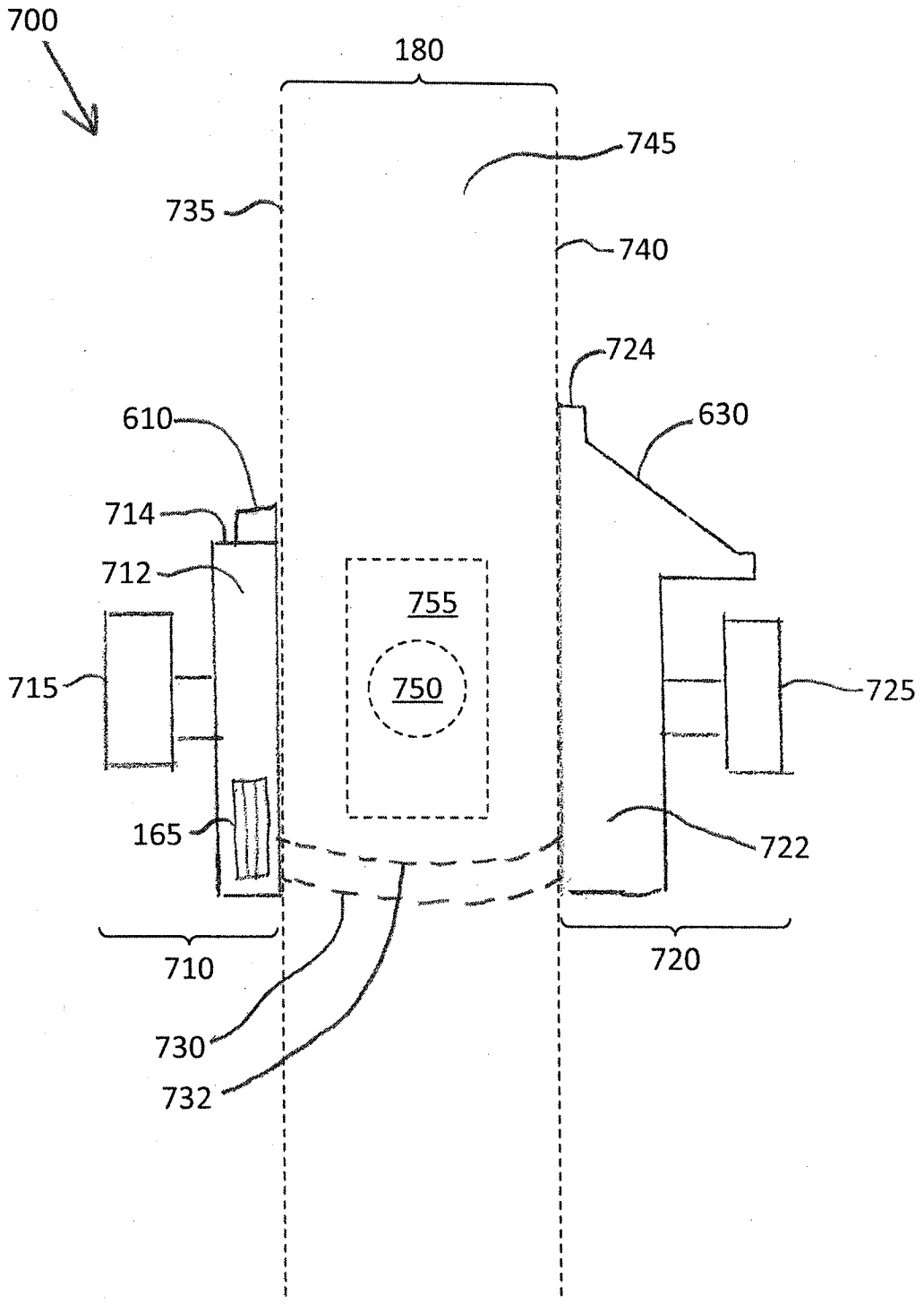
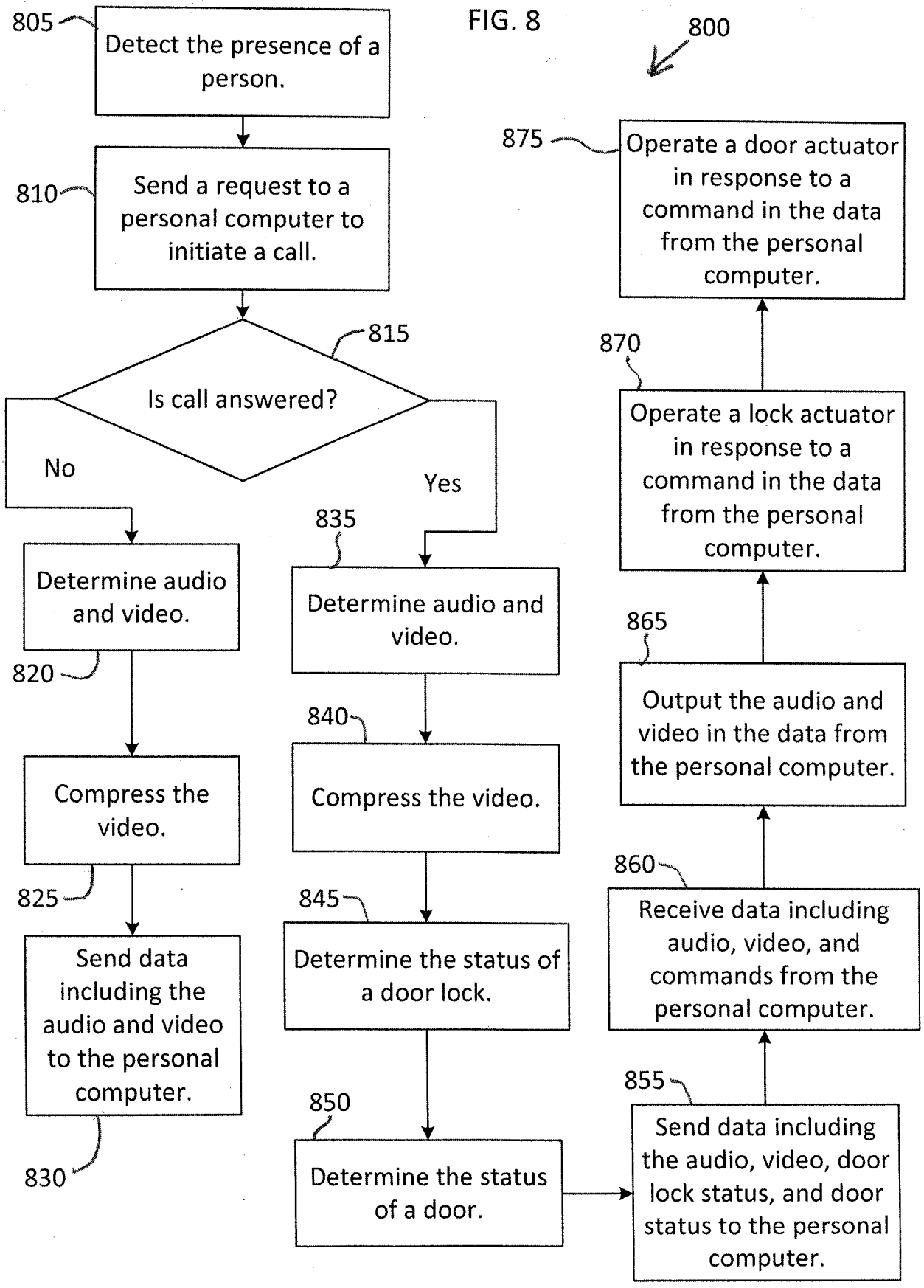

700
180
745
735
740
724
610
630
714
712
755
750
715
725
165
722
710
720
730
732

FIG. 7

FIG. 8


800
805
Detect the presence of a person.
810
Send a request to a personal computer to initiate a call.
815
Is call answered?
No
Yes
820
Determine audio and video.
825
Compress the video.
830
Send data including the audio and video to the personal computer.
835
Determine audio and video.
840
Compress the video.
845
Determine the status of a door lock.
850
Determine the status of a door.
855
Send data including the audio, video, door lock status, and door status to the personal computer.
860
Receive data including audio, video, and commands from the personal computer.
865
Output the audio and video in the data from the personal computer.
870
Operate a lock actuator in response to a command in the data from the personal computer.
875
Operate a door actuator in response to a command in the data from the personal computer.

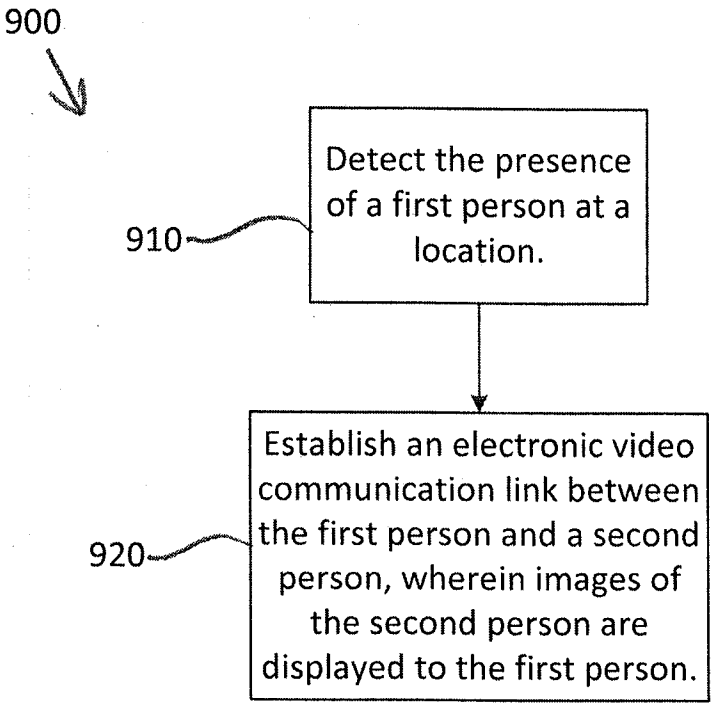

900
Detect the presence of a first person at a location.
910
Establish an electronic video communication link between the first person and a second person, wherein images of the second person are displayed to the first person.
920

FIG. 9

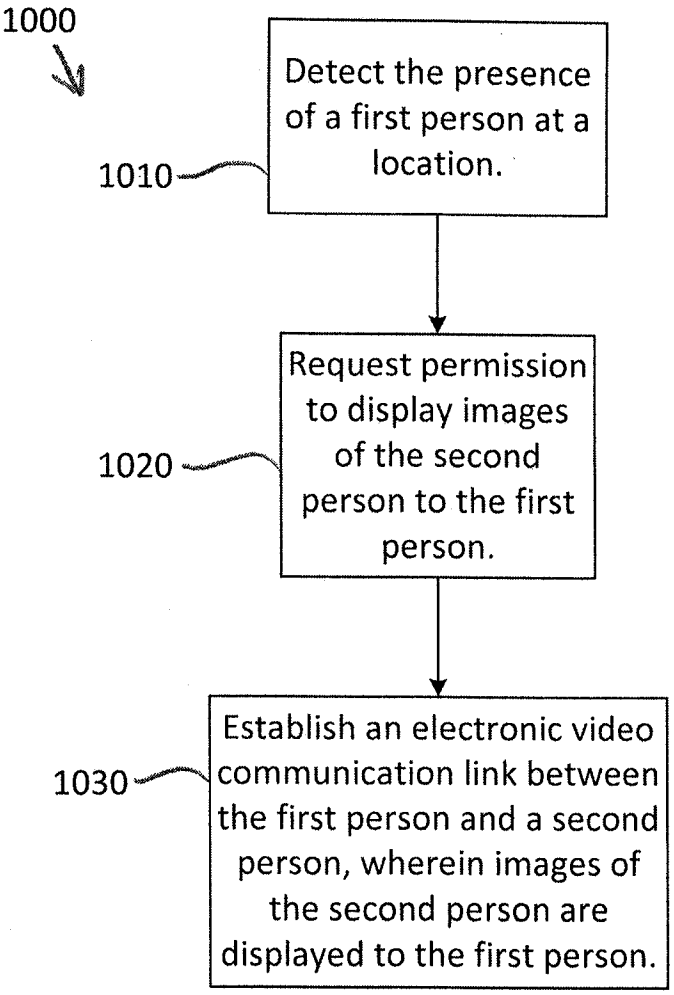

1000
Detect the presence of a first person at a location.
1010
Request permission to display images of the second person to the first person.
1020
Establish an electronic video communication link between the first person and a second person, wherein images of the second person are displayed to the first person.
1030

FIG. 10

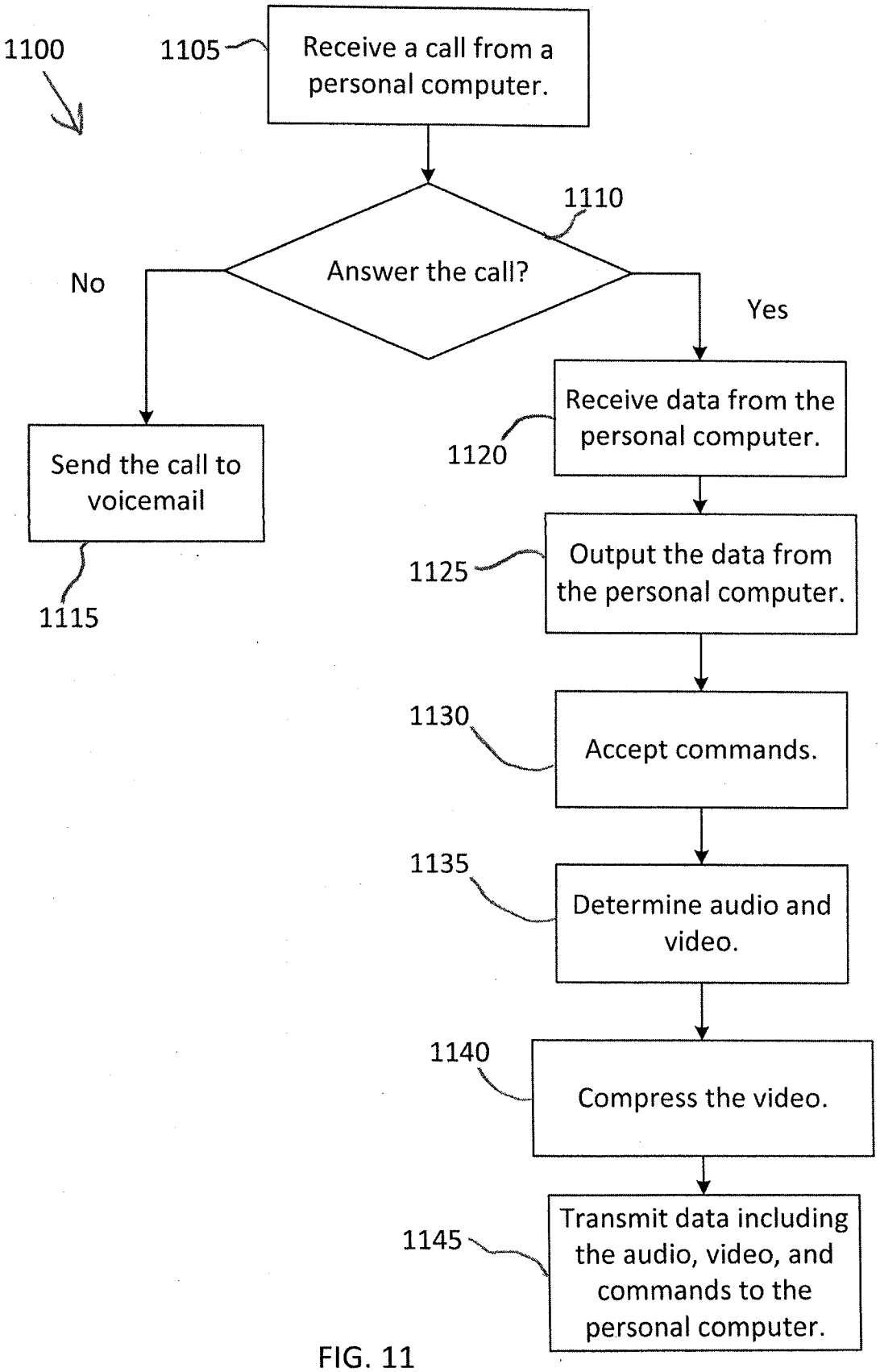

1100
1105
Receive a call from a personal computer.
1110
Answer the call?
No
Yes
Send the call to voicemail
1115
1120
Receive data from the personal computer.
1125
Output the data from the personal computer.
1130
Accept commands.
1135
Determine audio and video.
1140
Compress the video.
1145
Transmit data including the audio, video, and commands to the personal computer.

FIG. 11

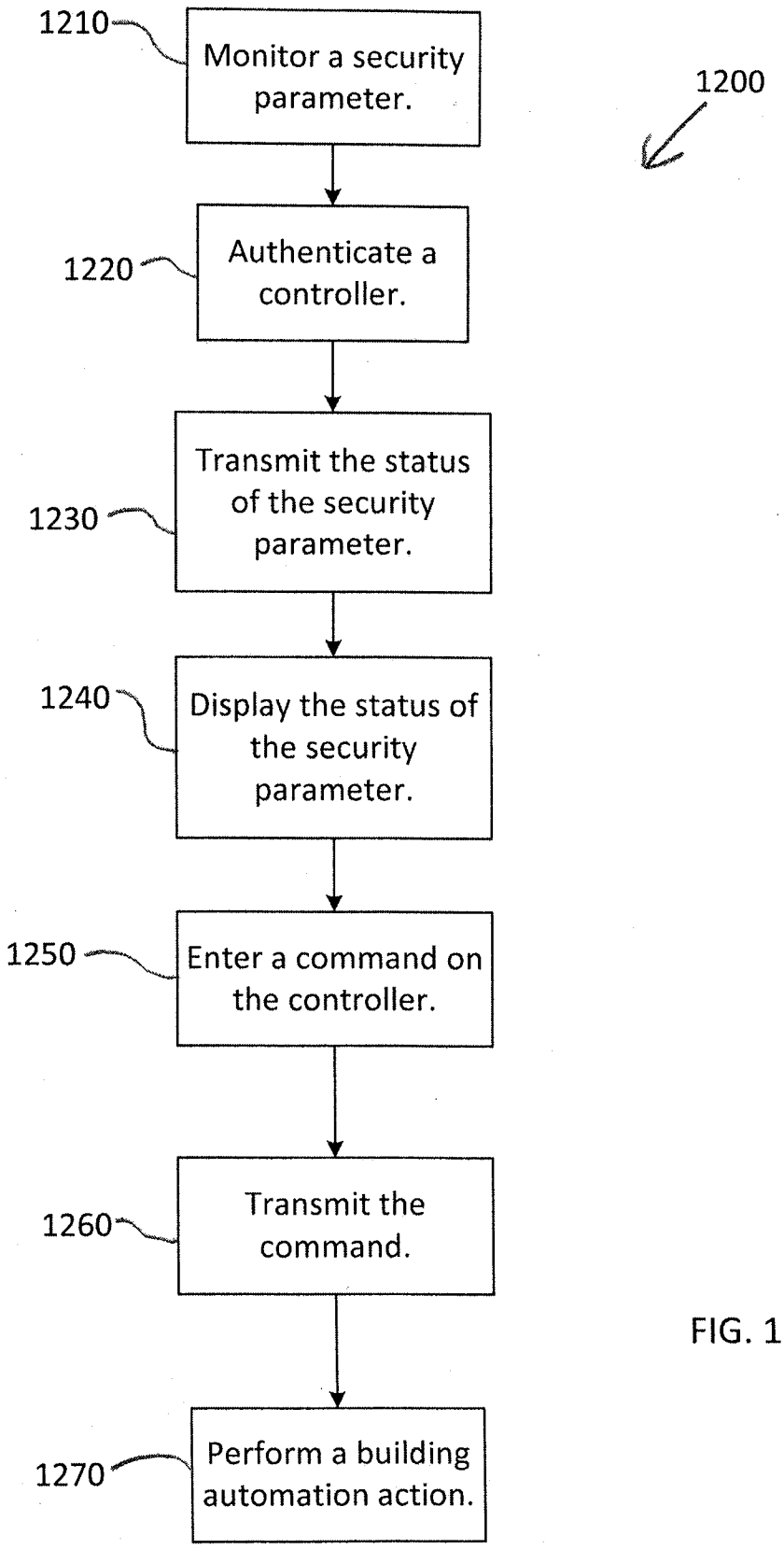

1210
Monitor a security parameter.
1200
1220
Authenticate a controller.
1230
Transmit the status of the security parameter.
1240
Display the status of the security parameter.
1250
Enter a command on the controller.
1260
Transmit the command.
1270
Perform a building automation action.

FIG. 12