SYSTEM AND METHODS FOR MANAGING WORK ORDERS AT A SITE LOCATION

Technical Field

The present disclosure generally relates to a system and methods for managing work orders at a site location. More particularly, the present disclosure describes various embodiments of a system and methods for managing work orders that are assigned to one or a plurality of site locations.

Background

Large organizations that are in charge of or manage multiple sites or site locations, such as residential areas, typically outsource or farm out some jobs or tasks, e.g. routine maintenance, day-to-day jobs, or other ad-hoc duties, to external firms. These external firms have better expertise in performing such jobs that are assigned as work orders by the organizations.

In some countries such as Singapore, residential areas are clustered into several constituencies. Each constituency represents a number of residential blocks and flats that are located within a predefined boundary. Every constituency is managed by organizations known as town councils. Each town council is in charge of maintaining the common areas of residential flats and estates within the town council's respective constituency. Such common areas include the common corridors, void decks, lifts, water tanks, external lighting and the open spaces surrounding the estates.

Town councils function as a manager or facilitator of maintaining the common areas of residential areas. In order to do the maintenance, or reparation if necessary, of the common areas, town councils normally engage external or independent contractors to perform the maintenance and/or reparation work and tasks. For example, if ground lobbies of a particular residential block are scheduled for weekly cleaning, the respective town council would hire or engage a contractor to do the job. The

contractor would thus be required to go to the particular residential block and clean the ground lobbies according to the schedule set by the town council.

Contractors are required to perform a set of tasks for each particular job or work. For example, if the job or work is to clean the ground lobbies, the set of tasks may include doing a general cleaning of the void deck, scrubbing the void deck with machine equipment, repairing unworkable lightings, etc. Contractors are expected to know their duties and to perform them accordingly when they are at the site location. However, there may be some contractors, especially those that are newly established or engaged by the town councils, which are not aware of the entire set of tasks that needs to be performed for a particular job or work order. Town councils do not always communicate the required set of tasks to contractors, and have a certain level of expectations that the contractors will still complete their jobs dutifully. In worse cases, some unscrupulous contractors may even report the work has been performed and completed, when in fact the contractors did not, or even did not go to the site location for doing the work.

In order to for the town councils to ensure the contractors have done their work, town councils may send property officers to inspect the site location. However, this can only be done after the town councils are made aware that the contractors have completed the job, if at all. There remains a need for town councils to be aware that the contractors are actually at the site location during the scheduled time for doing a particular job or work order.

Therefore, in order to address at least one of the aforementioned problems and/or disadvantages, there is a need to provide a system and methods for managing work orders at a site location, in which there are improved features that are beneficial to organizations and the firms that are engaged by them.

Summary

According to a first aspect of the present disclosure, there is provided a system for managing work orders at a site location. The system comprises: a remote computing

system for communicating a work order comprising a set of tasks associated therewith to be executed at the site location; and a computing device located away from and communicable with the remote computing system, the computing device configured for accessing the work order. The computing device is configured to generate at least one of: geolocation data of the computing device; and machine data obtained from a machine-readable object disposed at the site location, in response to the computing device detecting a first user action thereon. A location of the computing device is determined based on the at least one of the geolocation data and the machine data. The set of tasks associated with the work order is accessible on the computing device in response to the location of the computing device being determined to be the site location.

According to a second aspect of the present disclosure, there is provided a method for managing work orders at a site location by a user. The method comprises: receiving a work order on a computing device from a remote computing system, the computing device located away from the remote computing system, the computing device operable by the user; accessing the work order using the computing device, the work order comprising a set of tasks to be performed at the site location, the set of tasks being in an inaccessible state; detecting a first user action on the computing device; and triggering an unlocking process in response to detecting the first user action. The unlocking process comprises at least one of: generating geolocation data by the computing device; and generating machine data by the computing device from a machine-readable object disposed at the site location. The method further comprises: determining a location of the computing device based on the at least one of the geolocation data and the machine data; and transitioning the set of tasks from the inaccessible state to an accessible state if the location of the computing device is determined to be the site location, such that the accessible state allows the user to perform the set of tasks.

According to a third aspect of the present disclosure, there is provided a method for managing work orders at a site location by a user. The method comprises: receiving a work order on a computing device from a remote computing system, the computing device located away from the remote computing system, the computing device

operable by the user; accessing the work order using the computing device, the work order comprising a set of performed tasks to be inspected at the site location, the set of performed tasks being in an inaccessible state; detecting a first user action on the computing device; and triggering an unlocking process in response to detecting the first user action. The unlocking process comprising at least one of: generating geolocation data by the computing device; and generating machine data by the computing device from a machine-readable object disposed at the site location. The method further comprises determining a location of the computing device based on the at least one of the geolocation data and the machine data; and transitioning the set of performed tasks from the inaccessible state to an accessible state if the location of the computing device is determined to be the site location, such that the accessible state allows the user to inspect the set of performed tasks.

According to a fourth aspect of the present disclosure, there is provided a method for managing work orders at a site location by a user. The method comprises receiving a work order on a computing device from a remote computing system with the computing device located away from the remote computing system and the computing device operable by the user, accessing the work order using the computing device where the work order comprising a set of tasks to be performed at the site location and being indicative of the site location and the set of tasks being in an inaccessible state, and detecting a first user action on the computing device. The method further comprises triggering an unlocking process in response to detecting the first user action where the unlocking process comprising receiving acknowledgement of the work order by the user, and transitioning the set of tasks from the inaccessible state to an accessible state in response to acknowledgement of the work order being received from the user, such that the accessible state allows the user to perform the set of tasks.

An advantage of the system and methods of the present disclosure is that they provide a verification of the location of the computing device. The location of the computing device is checked based on at least one of geolocation data and machine data. Only if the computing device is at the correct site location, then the set of tasks becomes accessible. This ensures that the user of the computing device has to be at

the correct site location before he can proceed with the necessary tasks. This helps to avoid unwanted situations whereby users report tasks as being completed when they were not present at the site location in the first place. It also prevents the users from going to the wrong site location as each set of tasks is associated with a site location. This in turn prevents unnecessary errors such as arriving at the wrong location and performing unnecessary tasks. The set of tasks, when unlocked at the correct site location, further provides guidance to the users when they do their jobs.

A system and methods for managing work orders at a site location according to the present disclosure is thus disclosed hereinabove. Various features, aspects, and advantages of the present disclosure will become more apparent from the following detailed description of the embodiments of the present disclosure, by way of non-limiting examples only, along with the accompanying drawings in which like numerals represent like components.

Brief Description of the Drawings

FIG. 1 is a schematic layout of a system according to an embodiment of the present disclosure.

FIG. 2 is a flowchart of a method according to an embodiment of the present disclosure.

FIG. 3 is a flowchart of an unlocking process according to an embodiment of the present disclosure.

FIG. 4 is a flowchart of a method according to an embodiment of the present disclosure.

FIG. 5A and FIG. 5B show various screen captures of a computing device according to an embodiment of the present disclosure.

FIG. 6 shows a screen capture of a computing device according to an embodiment of the present disclosure.

FIG. 7 shows a screen capture of a computing device according to an embodiment of the present disclosure.

FIG. 8 shows a screen capture of a computing device according to an embodiment of the present disclosure.

FIG. 9 shows a screen capture of a computing device according to an embodiment of the present disclosure.

FIG. 10A, FIG. 10B, and FIG. 10C show various screen captures of a computing device according to an embodiment of the present disclosure.

FIG. 11A, FIG. 11B, and FIG. 11C show various screen captures of a computing device according to an embodiment of the present disclosure.

FIG. 12A, FIG. 12B, and FIG. 12C show various screen captures of a computing device according to an embodiment of the present disclosure.

Detailed Description

For purposes of brevity and clarity, descriptions of embodiments of the present disclosure are limited hereinafter to a system and methods for managing work orders at a site location, in accordance with the drawings in FIG. 1 to FIG. 12C. While aspects of the present disclosure will be described in conjunction with the embodiments provided herein, it will be understood that they are not intended to limit the present disclosure to these embodiments. On the contrary, the present disclosure is intended to cover alternatives, modifications and equivalents, which may be included within the spirit and scope of the present disclosure as defined by the appended claims. Furthermore, in the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the

present disclosure. However, it will be recognized by an individual having ordinary skill in the art, i.e. a skilled person, that the present disclosure may be practiced without these specific details. In other instances, well-known systems, methods, procedures, and components have not been described in detail as not to unnecessarily obscure aspects of the embodiments of the present disclosure.

In embodiments of the present disclosure, a system 100 for managing work orders at a site location is described hereinafter.

FIG. 1 shows a schematic layout of the system 100. Broadly, the system 100 includes an organization 110 for managing the work orders. The organization may outsource or farm out various works, jobs, and/or tasks to a first user 120 for performing them at various site locations. The first user 120 is or is part of a firm that is independent and separate from the organization 110.

In some non-limiting exemplary embodiments of the present disclosure, the organization 110 is a town council 110 and the first user 120 refers to contractors 120. According to the definition above, the town council 110 manages residential areas in its constituency. The town council 110 may hire or engage or assign the contractors 120 to perform various maintenance and/or reparation tasks at the residential areas, such as cleaning of void decks, repairing of spoilt lightings or elevators, clearing of rubbish bins, etc. These contractors 120 are typically independent companies that are specialized in performing such maintenance jobs, while the town councils 110 are the commissioners of these contractors 120.

Each town council 110 has a computing system 130, or a remote computing system 130 when seen from the contractor's perspective, to facilitate the town council's 110 management of the contractors 120 and their jobs. The town council 110 is located proximate to the residential areas within its constituency, and the computing system 130 is disposed within the town council 110.

As the town council 110 needs to manage multiple residential areas within its constituency, the town council 110 establishes a schedule or routine for jobs or work

orders that need to be done at the residential areas. For example, a specific residential block is scheduled for weekly cleaning every Monday. This specific residential block is thus designated as a site location 140. Other residential blocks and areas scheduled for other maintenance routines are correspondingly designated as other site locations 140, such that the town council 110 manages work orders for a plurality of site locations 140. This routine maintenance of the site location 140 may be assigned to the contractors 120, so that the contractors 120 will go to the site location 140 and perform the required tasks according to schedule.

The computing system 130 assigns or communicates jobs or work orders to the contractors 120 based on a schedule or routine established by the town council 110. In some embodiments, the town council 110 assigns the work orders to a first user office 160 or a main contractor 160 via the first communication link 150 as shown in FIG. 1. The main contractor 160 will then outsource various specific tasks required of the work orders to other contractors 120. In other embodiments, the town council 110 may directly liaise with the contractors 120 via a second communication link 170. Thus, the town council 110 will be able to bypass the main contractor 160 and can assign work orders directly to the contractors 120 via the second communication link 170.

Based on the routine schedule established by the town council 110, if a particular residential block has an impending job to be performed, the town council 110 generates a work order using the remote computing system 130. The work order is subsequently transmitted or communicated to the main contractor 160 via the first communication link 150, or directly to the contractors 120 via the second communication link 170. If the work order is received by the main contractor 160, it is the duty of the main contractor 160 to reassign the work order to the other contractors 120, in accordance with its contractual obligations to the town council 110. The reassignment of work orders from the main contractor 160 to the contractors 120 is done via a third communication link 180. Like the town council 110, the main contractor 160 has a computing system or a local computing system 190 for managing and assigning the work orders to the contractors 120.

In order to receive, access, and manage the work orders, the contractors 120 have a computing device 200, such as a mobile phone or smartphone. The computing device 200 is configured to receive work orders from the town council 110 and/or the main contractor 160. More specifically, the computing device 200 can receive and access the work orders from the remote computing system 130 of the town council 110 via the second communication link 170, and/or the computing device 200 can receive and access the work orders from the local computing system 190 of the main contractor 160 via the third communication link 180. The computing device 200 runs a software application to manage the work orders. The software application may be executable on various operating platforms of mobile phones, such as iOS, Android, and Windows. Thus, with the computing device 200, the contractors 120 can more efficiently receive work orders and the computing device 200 also provides a convenient communication means for the contractors 120, especially in situations when the contractors 120 need to communicate with other parties, as described afterwards.

Once the contractors 120 receive the work order for the site location 140, the contractors 120 will proceed to the site location 140 at the scheduled date and time. A supervisor of the contractors 120 holds the computing device 200 and assigns the appropriate duties to his workers at the site location 140, based on the work order accessible on the computing device 200. At the site location 140, the contractors 120, specifically the supervisor, need to use the computing device 200 to access a set of tasks associated with the work order. The contractors 120 are only aware that there is work order for a specific residential area, but are unable to access the set of tasks associated with the work order. Experienced contractors may still be able to perform the associated tasks because they are familiar with what needs to be done, especially if they have done it several times before. Other contractors may be less familiar, especially if it is a new or unique work order, and may require guidance on the tasks that need to be done. Thus, the set of tasks associated with the work order provides the contractors 120 with some guidance on the specific jobs to be done for the work order. For example, in a general work order of cleaning the lobby of a residential block, the set of tasks may include sweeping the void deck, washing the void deck, cleaning the elevators, clearing of rubbish bins, etc. The providence of the

set of tasks to the contractors 120 advantageously gives the contractors 120 a clearer picture and guided steps to perform the work order effectively and efficiently.

However, the set of tasks is not accessible on the computing device 200 unless the computing device 200 is at the site location 140. If the computing device 200 is at the site location 140, this would mean the contractors 120 are at the site location 140 and are ready to execute the work order. The set of tasks would become accessible on the computing device 200 if it is established that the computing device 200 is at the site location 140, thereby allowing the contractors 120 to perform the set of tasks accordingly. If the computing device 200 is not at the site location 140 or is at a different site location 140, the set of tasks remains inaccessible.

The computing device 200 is configured to generate geolocation data thereof. The geolocation data provides an indication as to whether the computing device 200 is at the site location 140. Thus, if the geolocation data of the computing device 200 corresponds to the geolocation data 210 of the site location 140, then there is verification that the computing device 200 is at the correct site location 140. The geolocation data of the computing device 200 may be generated by means of a geolocation module or a GPS module embedded therein. Other means or manners to generate or obtain the geolocation data include using A-GPS (service provider triangulation or network triangulation), Bluetooth (using low energy beacons), Wi-Fi (using locator nodes from signal repeaters), or NFC. A person having ordinary skill in the art would readily understand the different methods of obtaining geolocation data.

Additionally or alternatively, there is a machine-readable object 220 disposed at the site location 140. The machine-readable object 220 can be read or scanned by the computing device 200, and upon doing so, the computing device 200 generates machine data therein. The machine-readable object 220 may be a type of optical barcode or an optical machine-readable representation of data, such as the ubiquitous UPC barcode. Another example of optical barcodes for the machine-readable object 220 is the matrix barcode or QR code. Other than optical barcodes, the machine-readable object 220 can be radio frequency identification (RFID) tags. An RFID tag can be electronically embedded or stored with information pertaining to

the site location 140. The RFID tag can act as a passive transponder that would allow its information to be read by an external transceiver when the transceiver is close to the RFID tag. Other types of machine-readable objects 220 that employ wireless transmission include NFC tags, as readily known by a person having ordinary skill in the art.

The machine-readable object 220 may be disposed as a conspicuous location such that the contractors 120 can easily locate it, or at a more inconspicuous location so that residents passing by the area do not question about it. The machine-readable object 220 may also be housed in a lockable cabinet to prevent residents from mishandling it. In the example of an optical barcode as the machine-readable object 220, the computing device 200 comprises an imaging module, such as a camera, for scanning the optical barcode. By scanning the optical barcode 220, the computing device 200 generates machine data or optical barcode data that is representative of the optical barcode. In the example of an RFID tag as the machine-readable object 220, the computing device 200 comprises a transceiver to send a signal to the RFID tag and read its response, thereby generating machine data or RFID data that is representative of the RFID tag.

Thus, the location of the computing device 200 can be determined based on at least one of the geolocation data and the machine data. The determination of the location of the computing device 200 is determined by verifying against reference data, the reference data being associated with the site location 140. The reference data would thus be the geolocation data of the site location 140, and the machine data (e.g. optical barcode data or RFID data) associated with the machine-readable object 220 disposed at the site location 140. The reference data may be embedded or stored with the work order, such that when the computing device 200 receives the work order, the verification against the reference data can be performed directly within the computing device 200. If the generated geolocation data corresponds with the geolocation data of the correct site location 140 that is stored in the work order, and/or if the generated machine data corresponds with the machine-readable object 220 of the site location 140, then there is verification that the computing device 200 is at the correct site location 140.

Therefore, the verification of at least one of the geolocation data and the machine data against the reference data may be performed by the computing device 200 itself. In this case, the reference data is pre-downloaded or already present in the memory or storage of the computing device 200, possibly by way of receiving the work orders. However, in some alternative embodiments, the geolocation data and the machine data obtained or generated by the computing device may be transmitted from the computing device 200 to the remote computing system 130, so that the remote computing system 130 can perform the verification against the reference data. In this case, the reference data associated with the work order is stored in the remote computing system 130 for performing verification process.

If the computing device 200 is determined to be at the correct site location 140, then the set of tasks becomes accessible on the computing device 200. If both the geolocation data and the machine data are incorrect or do not correspond to the correct site location 140, then the computing device 200 is at the wrong site location 140. As such, the computing device 200 would not be able to access the set of tasks. Advantageously, the verification (or partial verification) of the location of the computing device 200 to access the set of tasks ensures that more detailed instructions (in the set of tasks) of the work order are communicated to the contractors 120 only when the contractors 120 are at the correct site location 140 based on the routine schedule established by the town council 110.

However, in some cases when attempting to determine the location of the computing device 200 using both the generated geolocation data and the machine data, one of the geolocation data and machine data may not be available for verification. The computing device 200 is configured to take into account such possibilities, and allow the set of tasks to become accessible even if only one of the geolocation data and machine data is available and verified against the reference data.

One example of such cases would be the machine data is verified against the reference data but the geolocation data is not. This could be due to the geolocation data not corresponding to reference geolocation data 210 of the site location 140, or

due to a lack of a stable signal to generate the geolocation data. The contractors 120 can make note of this on the computing device 200, such as entering or keying into an event log in the software application running on the computing device 200. The computing device 200 can push the process of generating the geolocation data to the background or as a background process, and allow the computing device 200 to temporarily bypass the requirement of the geolocation data. This would in turn allow the set of tasks to become accessible, as the machine data has been verified, so that the contractors 120 can still proceed with the work order. In the process of the contractors 120 performing the work order, the computing device 200 will continue to attempt to verify the geolocation data in the background. For example, as the work is in progress and the contractors 120 are moving around, it may reach a point where the computing device 200 can obtain a good and stable signal to generate the geolocation data. The computing device 200 will attempt the verification against the reference geolocation data 210 of the site location 140 once the stable signal becomes available. If after a predetermined period of time the geolocation data still cannot be verified, i.e. after the service has timed-out, this information would be sent to the town council 110 for records purposes, and the town council 110 can take further measures to resolve this issue. The contractors 120 can still proceed with the work order because the set of tasks has already been made accessible due to the partial verification from the machine data.

In another example, the geolocation data is verified against the reference data but the machine data is not. This could be due to the generated machine data not corresponding to machine-readable object 220 of the correct site location 140, or due to a defective machine-readable object 220 disposed at the site location 140. The computing device 200 may prompt or notify the user that the geolocation data has been verified, but the machine data could not be verified. The computing device 200 may further prompt the user to select whether to bypass the process of verifying the machine data. If the user selects the bypass, the set of tasks would still become accessible on the computing device 200 as the geolocation data has been verified. Additionally, the computing device 200 logs this bypass in a report that is sent to the town council 110. The report contains the reasons of selecting the bypass and possibly an explanation as to why the machine data cannot be generated, such as

due to a defective machine-readable object 220. This report may be like an incident report as described below, or a separate notification that alerts the town council 110 of the problems in getting the machine data verified. For example, if the machine-readable object 220 is defective, the town council 110 will become aware of this after receiving the report, and can take measures to repair or replace the machine-readable object 220. The contractors 120 can still proceed with the work order because the set of tasks has already been made accessible due to the partial verification from the geolocation data.

In embodiments of the present disclosure, the system 100 broadly includes a second user 230 who will be tasked by the organization 110 to do work at the site location 140. The second user 230 may be external parties engaged by the organization 110, or may be an employee of the organization 110.

In some non-limiting exemplary embodiments of the present disclosure, the second user 230 is a town council officer or a property officer 230 who will be tasked to inspect the work done at the site location 140. The property officer 230 is a person assigned by the town council 110 and is independent of the contractors 120 and/or main contractor 160. The property officer 230 uses a computing device 240 that is substantially similar to the computing device 200 used by the contractors.

The computing device 240 allows the property officer 230 to receive, access, and manage the work orders of inspecting the work done by the contractors 120. The computing device 240 is configured to receive work orders or inspection orders from the town council 110. More specifically, the computing device 240 can receive and access the inspection orders from the remote computing system 130 of the town council 110 via the fourth communication link 250. The computing device 240 runs a software application to manage the work orders. The software application may be executable on various operating platforms of mobile phones, such as iOS, Android, and Windows. Thus, with the computing device 240, the property officer 230 can more efficiently receive inspection orders from the town council 110. The computing device 240 also provides a convenient communication means between the property officer 230 and the town council 110.

After the contractors 120 have completed their work order at the site location 140, the completion is reported back to the town council 110. The completion is reported back by communicating an action data from the computing device 200 to the remote computing system 130. The town council 110 then instructs the property officer 230, preferably with the computing device 240, to go to the site location 140 and inspect the work done by the contractors 120. In the instruction order or inspection order of the property officer 230, there is also a set of tasks associated therewith. In some situations, the property officer 230, upon arriving at the site location 140, is not aware of the duties or tasks that were performed by the contractors 120. Thus, the set of tasks in the inspection order for the property officer 230 provides guidance as to what to check and look out for during the inspection process. This advantageously gives the property officer 230 a clearer picture and guided steps to perform the inspection order effectively and efficiently.

However, like the contractor's computing device 200, the set of tasks in the property officer's computing device 240 is not accessible unless the computing device 240 is at the site location 140. If the computing device 240 is at the site location 140, this would mean the property officer 230 is at the site location 140 and are ready to execute the inspection order. The set of tasks would become accessible on the computing device 240 if it is established that the computing device 240 is at the site location 140, thereby allowing the property officer 230 to perform the set of inspection tasks accordingly. If the computing device 240 is not at the site location 140 or is at a different site location 140, the set of tasks remains inaccessible.

It would be readily understood by a person having ordinary skill in the art that the accessing of the set of tasks using the property officer's computing device 240 is similar or analogous to the aforementioned description in relation to the contractor's computing device 200. More particularly, the property officer's computing device 240 also utilizes geolocation data and machine data to verify the location of the computing device 240. The determination of the location of the computing device 240 can be based on verification of both the geolocation data and machine data, or

partial verification of only one of them, as described above in regards to the contractor's computing device 200.

Thus, the location of the computing device 240 can be determined based on at least one of the geolocation data and the machine data. If the computing device 240 is determined to be at the correct site location 140, then the set of inspection tasks becomes accessible on the computing device 240. If both the geolocation data and the machine data are incorrect or do not correspond to the correct site location 140, then the computing device 240 is at the wrong site location 140. As such, the computing device 240 would not be able to access the set of inspection tasks. Advantageously, the verification (or partial verification) of the location of the computing device 240 to access the set of inspection tasks ensures that the property officer 230 is in fact at the site location 140 to perform the inspection process, and also provides him with clearer guidance on what to inspect. Preferably, the set of inspection tasks for the property officer 230 mirrors the set of tasks in the work order for the contractors 120, i.e. the set of performed tasks of the contractors 120.

After the set of performed tasks is inspected by the property officer 230, an action data is communicated from the computing device 240 to the remote computing system 130, thereby notifying the town council 110 of the completion of the inspection of the tasks done by the contractors 120. The inspection done by the property officer 230 on the set of performed tasks of the contractors 120 allows the town council 110 to exert greater control over the quality of the work performance of the contractors 120.

Moreover, the property officer 230 only goes to inspect the tasks only after the contractors 120 have completed the work. The completion of the work is made known to the town council 110 which then informs the property officer 230 of the same. This prevents the property officer 230 from making unnecessary trips to the site location 140 if the work has not started or is still incomplete. This can occur because the property officer 230 and the contractors 120 work in different organizations, and the communication between them may be lacking somewhat. These unnecessary trips (to inspect site locations 140 with incomplete work done)

waste the property officer's 230 time and reduce productivity. It is thus more advantageous to inspect only site locations 140 where there are confirmations of completion of the tasks by the contractors 120.

The computing device 200 or 240 in the system 100 may further be configured to communicate an incident report to the remote computing system 130, the incident report being associated with at least one of the set of tasks and the site location 140. The incident report may contain reports / notifications / alerts regarding defects / problems / issues observed at the site location 140, or that are related to the set of tasks. The reporting of defects back to the remote computing system 130 and the town council 110 allows the town council 110 to readily make itself known to problems occurring at its residential areas, and to tackle unprofessional contractors who are not doing a proper job in maintaining the residential areas.

The computing device 200 or 240 may also be configured to communicate messages, exchange data and activity and project status with each other, and/or with the remote computing system 130. The presence of such an exchange environment allows for communication between the various parties using the respective computing devices (200 and 240) and system (130). For example, the contractors 120 or the supervisor thereof can use the first computing device 200 to communicate with the property officer 230 who is using the second computing device 240. Such communication could help the contractors 120 resolve issues that may occur when they are performing the work orders at the site location 140, and also to gather information from the property officer 230 as to what to look out for when working the tasks. The exchange environment may also be used to communicate with the town council 110, such as to report that the contractor's 120 tasks are completed, or to report that the property officer's 230 inspection job is done.

In a further elaboration, the first communication link 150, second communication link 170, the third communication link 180, and the fourth communication link 250 are generally based on data communications known to the skilled person. For example, these data communications may include wired connections such as LAN and DSL, and/or may include wireless connections include such as Wi-Fi, GPRS, 3G, 4G, and

LTE. The communication links may also be indirectly linked to an internet cloud such that all communication occurring through the communication links are centralized and saved at a common space.

Additionally, although some exemplary computing configurations have been described herein, particularly in regards to the remote computing system 130 and the computing device 200, which follows a server-client relationship, these examples are not meant to be limiting on the types of possible computing configurations. Other computing configurations beyond the mentioned server-client relationship are also possible in other embodiments of the present disclosure. Such computing configurations include node-to-node type configuration, node-to-node type configuration together with a coordinating server, and node-to-client type configuration, and client-to-client type configuration. The various types of computing configurations applicable in the embodiments of the present disclosure would be readily apparent and understood by a person having ordinary skill in the art.

In embodiments of the present disclosure, there is provided a method 300 for using the system 100. Broadly, there is a method 300 for managing work orders at a site location 140 by the organization 110 operating the remote computing system 130, and the first user 120 operating the computing device 200.

In some non-limiting embodiments, the organization 110 is the town council 110 and the first user 120 refers to the contractors 120. As such, there is a method 300 for managing work orders at a site location 140 by contractors 120 operating the computing device 200. Referring to FIG. 2, the method 300 comprises a step 310 of receiving a work order or an instruction order on the computing device 200. The work order or instruction order originates from the remote computing system 130 of the town council 110, which is located away from the computing device 200. The method 300 further comprises a step 320 of accessing the work order or instruction order using the computing device 200. The work order comprises a set of tasks that is assigned to the contractors 120 to perform at the site location 140. However, the set of tasks is in an inaccessible state or is inaccessible on the computing device 200,

unless the computing device 200 has been verified to be at the correct site location 140.

The method 300 further comprises a step 330 of detecting a first user action on the computing device 200. The first user action is performed by the supervisor of the contractors 120, i.e. the person holding the computing device 200. The first user action may be the tapping of a button on the screen of the computing device 200, providing an input thereto, or performing a gesture on the computing device 200. Upon the computing device 200 detecting the first user action, the method 300 triggers an unlocking process 400 in a step 340. Referring to FIG. 3, the unlocking process 400 is a series of steps for determining the location of the computing device 200 and to verify whether the computing device 200 is at the correct site location 140.

The unlocking process 400 comprises a step 410 of generating geolocation data by the computing device 200. The computing device 200 is configured to generate geolocation data thereof. The geolocation data provides an indication as to whether the computing device 200 is at the site location 140. Thus, if the geolocation data of the computing device 200 corresponds to the geolocation data 210 of the site location 140, then there is verification that the computing device 200 is at the correct site location 140.

Additionally or alternatively, the unlocking process 400 comprises a step 420 of generating machine data obtained, with the use of the computing device 200, from a machine-readable object 220 disposed at the site location 140. As already elaborated above, the machine-readable object 220 can be a UPC barcode, QR code, RFID tag, or NFC tag, etc. The computing device 200 reads or scans the machine-readable object 220 to generate machine data.

The method 300 further comprises a step 350 of determining a location of the computing device 200 based on the at least one of the geolocation data and the machine data generated by the computing device 200.

If the geolocation data and the machine data are verified to be that of the correct site location 140, then the computing device 200 is determined to be at the correct site location 140. In a step 360 of the method 300, the set of tasks associated with the work order then transitions from the inaccessible state to an accessible state if the location of the computing device 200 is determined to be the site location.

If both the geolocation data and/or machine data of the computing device 200 do not correspond to the correct site location 140, then the location of the computing device 200 is not determined to be the correct site location 140. As such, the set of tasks is maintained in the inaccessible state in a step 370 of the method 300. However, as described above, if either of the geolocation data or the machine data is not verified, the set of tasks can still transition from the inaccessible state to the accessible state.

For example, if the geolocation data is not verified, the computing device 200 may be able to push the process of generating the geolocation data to the background in a step 375 of the method 300. Partial verification of only the machine data in a step 380 of the method 300 allows the computing device 200 to temporarily bypass the geolocation verification requirement and allow the contractors 120 to continue with the work. The computing device 200 continues to process the generation of the geolocation data until it succeeds, or until the process times-out. A person having ordinary skill in the art would be able to understand the application of the aforementioned description in this regard.

For example, if the machine data is not verified, the user can select on the computing device 200 to bypass the process of verifying the machine data in a step 385 of the method 300. This will be logged on the computing device 200 and a report or alert will be sent to the town council 110. Partial verification of only the geolocation data in the step 380 allows the computing device 200 to temporarily bypass the machine data verification requirement and allow the contractors 120 to continue with the work. A person having ordinary skill in the art would be able to understand the application of the aforementioned description in this regard.

After the contractors 120 have completed the set of tasks at the site location 140, a second user action is performed on the computing device 200. The second user action may be tapping a button or performing a gesture on the computing device 200. The detection of the second user action on the computing device 200 generates an action data which is transmitted from the computing device 200 to the remote computing system 130. This in turn notifies the town council 110 that the set of tasks at the site location 140 has been completed.

The method 300 may further comprise a step 390 for communicating messages between the computing device 200 and at least one of the remote computing system 130 and a second computing device such as the property officer's computing device 240. The step 390 relates to an exchange environment that can be activated in the computing device 200, as described hereafter.

FIG. 4 shows a flowchart of a method according to embodiments of the present disclosure. Broadly, a second user 230 is required by the organization 110 to perform other jobs at the site location 140, such as to inspect the work performed by the first user 120 at the site location 140.

In some non-limiting embodiments of implementing the system 100, the organization 110 is the town council 110 and the second user 230 is the property officer 230. The property officer 230 is required by the town council 110 to inspect the job done by the contractors 120 at the site location 140, often after the contractors 120 have finished their work and reported back to the town council 110. There is thus provided a method 500 for managing work orders at a site location 140 by a property officer 230 operating the computing device 240. Referring to FIG. 4, the method 500 comprises a step 510 of receiving a work order or an instruction order or an inspection order on the computing device 240. The work order originates from the remote computing system 130 of the town council 110, which is located away from the computing device 240. The method 500 further comprises a step 520 of accessing the work order using the computing device 240. The work order comprises a set of tasks that is assigned to the property officer 230 to perform at the site location 140. Specifically, the property officer 230 is required to inspect the tasks that

were done or performed by the contractors 120 at the site location 140. Thus, the set of tasks specifically relates to a set of performed tasks that needs to be inspected by the property officer 230, wherein the set of performed tasks substantially corresponds to the tasks or jobs done by the contractors 120 at the site location 140. However, the set of performed tasks is in an inaccessible state or is inaccessible on the computing device 240, unless the computing device 240 has been verified to be at the correct site location 140.

The method 500 further comprises a step 530 of detecting a first user action on the computing device 240. The first user action is performed by the property officer 230 who is holding the computing device 240. The first user action may be the tapping of a button on the screen of the computing device 240, providing an input thereto, or performing a gesture on the computing device 240. Upon the computing device 240 detecting the first user action, the method 500 triggers an unlocking process 400 in a step 540.

Referring to FIG. 3, the unlocking process 400 is a series of steps for determining the location of the computing device 240 and to verify whether the computing device 240 is at the correct site location 140. The unlocking process 400 for the property officer's computing device 240 is similar or analogous to that for the contractor's computing device 200 elaborated above, as readily understood by a person having ordinary skill in the art.

The method 500 further comprises a step 550 of determining a location of the computing device 240 based on the at least one of the geolocation data and the machine data generated by the computing device 240. The determination of the location of the computing device 240 may be performed by either the computing device 240 itself, or by the remote computing system 130 after the geolocation data and/or machine data has been transmitted thereto.

If the geolocation data and the machine data are verified to be that of the correct site location 140, then the computing device 240 is determined to be at the correct site location 140. In a step 560 of the method 500, the set of performed tasks associated

with the work order then transitions from the inaccessible state to an accessible state if the location of the computing device 240 is determined to be the site location.

If the location of the computing device 240 is not determined to be the correct site location 140, i.e. both the geolocation data and machine data of the computing device 240 do not correspond to the correct site location 140, then the set of performed tasks is maintained in the inaccessible state in a step 570 of the method 500. However, as described above, if either of the geolocation data or the machine data is not verified, the set of tasks can still transition from the inaccessible state to the accessible state.

For example, if the geolocation data is not verified, the computing device 240 may be able to push the process of generating the geolocation data to the background in a step 575 of the method 500. Partial verification of only the machine data in a step 580 of the method 500 allows the computing device 200 to temporarily bypass the geolocation verification requirement and allow the property officer 230 to continue with the inspection work. A person having ordinary skill in the art would be able to understand the application of the aforementioned description in this regard.

For example, if the machine data is not verified, the property officer 230 can select on the computing device 240 to bypass the process of verifying the machine data in a step 585 of the method 500. This will be logged on the computing device 240 and a report or alert will be sent to the town council 110. Partial verification of only the geolocation data in the step 580 allows the computing device 240 to temporarily bypass the machine data verification requirement and allow the property officer 230 to continue with the inspection work. A person having ordinary skill in the art would be able to understand the application of the aforementioned description in this regard.

After the property officer 230 has inspected the set of performed tasks at the site location 140, a second user action is performed on the computing device 240. The second user action may be tapping a button or performing a gesture on the computing device 240. The detection of the second user action on the computing device 240 generates an action data which is transmitted from the computing device

240 to the remote computing system 130. This in turn notifies the town council 110 that the set of performed tasks at the site location 140 has undergone inspection.

The method 500 may further comprise a step 590 for communicating messages between the computing device 240 and at least one of the remote computing system 130 and a second computing device such as the contractor's computing device 200. The step 590 relates to an exchange environment that can be activated in the computing device 240, as described hereafter.

FIG. 5A to FIG. 12C show various screen captures of the computing devices 200 and 240 during execution of the methods 300 and 500, respectively.

FIG. 5A and FIG. 5B show a screen 600 on the computing device 200. The screen 600 shows the routine schedule that is assigned by the town council 110 to the contractors 120. The screen 600 further shows the various work orders 602 that are scheduled for each date 604. The list of work orders 602 can be switched between the dates 604 by sliding the scroll bar 606. Each of the work orders 602 represent a residential block, that is under the care of the town council 110, and has a set of tasks associated therewith. All of the work orders 602 assigned to the contractors 120 may be displayed on the screen 600, categorized according to contractor groups 608. For example, residential blocks located in close proximity to one another are categorized under a first contractor group 608a, which would be managed by a first supervisor of the contractors 120. Other residential blocks located further away are categorized under a second contractor group 608b, which would be managed by a second supervisor of the contractors 120. This allows the same contractor company to supervise and manage different work orders 602 at different residential areas, all of which are under the care of the town council 110.

To proceed with a specific work order 602a, the contractors 120 have to arrive at the correct site location 140 where the work order 602a is to be performed. As shown in FIG. 6, upon arrival at the site location 140, the supervisor of the contractors 120 taps on the specific work order 602a on the computing device 200 in order to trigger the unlocking process 400 as described above. The generation of the geolocation

data of the computing device 200 is similar to that as discussed above. A screen 610 may be displayed to show that the computing device 200 is generating the geolocation data, as shown in FIG. 7. Alternatively or additionally, machine data from a machine-readable object 220 disposed at the site location 140 may be generated to verify the location of the computing device 200, as described above in the methods 300 and 500. In the example shown in FIG. 6, the machine-readable object 220 is an optical barcode (QR code) 220 that can be read or scanned by a camera on the computing device 200. The user of the computing device 200 taps on the scan function 612 shown in FIG. 6, and proceeds to point the camera of the computing device 200 towards the QR code 220 disposed at the site location 140. Upon detection of the optical barcode 220 as shown in the screen 620 of FIG. 8, the computing device 200 analyzes it and generates the machine data.

However, if the contractors 120 or their supervisor finds that the machine-readable object 220 (e.g. optical barcodes or RFID tags) is missing or defective or otherwise unavailable at the site location 140, this is reported back to the town council 110 by tapping on the alert icon 614 shown in FIG. 6. This then allows the supervisor to report that the affected residential block as a missing or defective machine-readable object 220. A screen 630 in FIG. 9 shows that the machine-readable object 220 is a QR code and is being reported as missing / defective. Upon being notified of the missing machine-readable object 220, the town council 110 can engage or hire other firms to repair or replace the machine-readable object 220 at the residential block. The communication between the contractors 120 and the town council 110 using the computing device 200 allows for more efficient and quick resolution of problems and issues.

Based on at least one of the geolocation data and the machine data, the computing device 200 is able to verify whether it is at the correct site location 140. The work order 602a is specific to residential block or site location 140 and thus has specific geolocation data and machine data associated therewith. If both the geolocation data and the machine data generated by the computing device 200 matches, then the computing device 200 is at the correct site location 140. Alternatively, the geolocation data and machine data may be transmitted from the computing device

200 to the remote computing system 130 of the town council 110 for determining the location of the computing device 200.

As described above, if only one of the geolocation data and the machine data can be verified, i.e. partial verification, the computing device 200 may still be able to access the set of tasks associated with the work order 602a. Upon verification or partial verification of the location of the computing device 200, the set of tasks associated with the work order 602a becomes accessible on the computing device 200. Without accessing the set of tasks on the computing device 200, the contractors 120 cannot report to the town council 110 that the work order has been executed. Thus, the accessibility of the set of tasks allows the town council 110 to ensure that the contractors 120 dutifully execute the work order at the correct site location 140.

FIG. 10A to FIG. 10C are images of a screen 640 which display a set of tasks 642 associated with the work order 602a. The set of tasks 642 may include items such as cleaning the void deck (642a) and scrubbing the common corridors (642b). If the contractors 120 have completed at least one task 642, such as cleaning the void deck (642a), the supervisor may tap on the computing device 200 and check the respective boxes 644. For example, if the contractors 120 have finished cleaning the void deck, the supervisor checks the box 644a, as shown in FIG. 10B. If the contractors 120 have completed all of the tasks 642, the supervisor may check the “check all” box 646, shown in FIG. 10C, as a shortcut to check all the boxes 644. The supervisor may also tap on the “save” button 648a to temporary save the statuses of the set of tasks 642, or tap on the “finish” button 648b after the set of tasks 642 for this site location 140 has been completed. By tapping the “finish” button 648b, the computing device 200 transmits this information to the remote computing system 130, thereby quickly notifying the town council 110 that the work order 602a for this site location 140 has been completed.

The town council 110 may subsequently send a property officer 230 to the site location 140 to inspect the work done by the contractors 120. The property officer 230 uses the computing device 240 to perform this inspection job and generate a service report for the town council 110. The property officer 230 is sent only after the

town council 110 receives confirmation that the contractors 120 have completed their work order 602a at the site location 140. This is to prevent the property officer 230 from making unnecessary trips to the site location 140 if the work has not started or is still incomplete, thereby saving time and improving productivity.

FIG. 11A is an image of a screen 650 showing a service report 652 to be submitted to the town council 110 for records maintenance. The service report 652 may include a plurality of work orders or instruction orders or inspection orders 654, which represent residential blocks or site locations 140 where the property officer 230 is required to inspect. For example, the work order 654a relates to a specific residential block or site location 140, and shows a list of task categories 656 that the contractors 120 were supposed to have completed. However, further details on the specific tasks in each category 656 are inaccessible unless the property officer 230 and the computing device 240 are verified to be at the correct site location 140. The unlocking process 400 is triggered when the property officer 230 taps on the unlock button 658. Determination and verification of the location of the computing device 240 also uses the geolocation data and machine data. It would be readily understood by the skilled person that the aforementioned location determination process for the computing device 200 applies analogously to the computing device 240.

As described above, if only one of the geolocation data and the machine data can be verified, i.e. partial verification, the computing device 240 may still be able to access the set of tasks associated with the work order 654a. Upon verification or partial verification of the location of the computing device 240, the set of tasks associated with the work order 654a become accessible on the computing device 240. The accessibility of the set of tasks allows the property officer 230 to know what are the tasks or jobs that the contractors have performed, such that the property officer 230 can do the inspection accordingly and report back to the town council 110.

FIG. 11B is an images of a screen 660 which display a set of tasks 662 associated with the work order 654a. The set of tasks 662 substantially mirrors the set of tasks 642 for the contractors 120, so that the property officer 230 knows exactly what tasks the contractors 120 have done and what to inspect. The set of tasks 662, i.e. the set

of tasks performed by the contractors 120, may include items such as washing the void deck (662a) and the common corridors (662b). The property officer would be required to inspect the void deck and the common corridors to verify whether the contractors 120 have indeed washed said areas, and whether the jobs are properly done.

If the property officer 230 has inspected at least one task 662, such as the void deck (662a) or common corridors (662b), the property officer 230 may tap on the computing device 240 and check the respective boxes 664. For example, if the property officer 230 has finished inspecting the void deck, the property officer 230 checks the box 664a, as shown in FIG. 11B. If the property officer 230 has completed and inspected all of the tasks 662, the property officer 230 may check the "check all" box 666 near the top portion of the screen 660 as a shortcut to check all the boxes 664. The property officer 230 may also tap on the "save" button 668a to temporary save the statuses of inspection of the set of performed tasks 662, or tap on the "finish" button 668b after the set of performed tasks 662 for this site location 140 has been completed and inspected. By tapping the "finish" button 668b, the computing device 240 transmits this information to the remote computing system 130, thereby quickly notifying the town council 110 that the work order or inspection order 654a for this site location 140 has been completed.

In some situations, the property officer 230, or even the contractors 120, may observe some defects or problems at the site location 140. For example, the property officer 230 may find that rubbish bins are not properly cleared, which may possibly be due to the fault of the contractors 120 for not properly doing their job, or also possibly due to residents throwing rubbish after the contractors 120 have left. Such defects are thus associated with at least one of the set of performed tasks 662 and the site location 140. The defects observed by the property officer 230 at the site location 140 can be reported back as an incident report or defect report to the town council 110, specifically through transmission from the computing device 240 to the remote computing system 130. FIG. 11C is an image of a screen 670 showing an incident report or defect report 672 that can be sent to the town council 110.

Referring to FIG. 11B, each item in the set of performed tasks (for inspection) 662 has a corresponding “defect report” button 674. For example, if the property officer 230 observes that the void deck (corresponding to task 662a) has a defect or problem or issue, the property officer 230 can tap the corresponding “defect report” button 674a. Upon tapping the “defect report” button 674a, the screen 660 in FIG. 11B transitions to the screen 670 in FIG. 11C, allowing the property officer 230 to furnish details regarding the defect.

On the screen 670 in FIG. 11C, the defect report 672 shows details as to which residential block or site location the defect was observed, based on the geolocation data and/or machine data of the computing device 240. The property officer 230 may choose to furnish photographic evidence of the defect, by capturing a photograph using the photo button 676a. Photographic evidence may also be furnished by using the library button 676b to retrieve an already-captured photograph from the computing device’s 240 storage or memory. The screen 670 shows some examples of photographic evidence of defects at a site location 140, such as rubbish bins being left uncleared (photo 678a) or presence of vandalism or graffiti on the walls of the void deck (photo 678b). Other forms of evidence can also be captured and furnished, such as videographic evidence from videos or films captured using the computing device 240.

With reference to FIG. 5A and FIG. 5B, each of the computing devices 200 and 240 includes an exchange environment function or messaging channel accessible with the exchange function embodied by chat button 616. FIG. 12A to FIG. 12C show various screen captures of the exchange environment 700.

As discussed earlier, one contractor firm 160 may be engaged by the town council 110 to perform work orders 602 at various site locations 140. The contractor firm 160 may assign different contractor groups 608 to the different site locations 140, each contractor group 608 for one site location 140. Each contractor group 608 has a supervisor who is in charge of using the computing device 200. In some cases, one supervisor may want to communicate with or update the supervisor(s) of the other contractor groups 608, or with other personnel from the contractor firm 160. The

exchange environment 700 is integrated with the job tracking functionality of the work orders (602 and 654) in the computing devices (200 and 240), providing a single platform for managing work orders.

FIG. 12A is an image of a screen 710 of the exchange environment 700 on the computing device 200. A supervisor of a contractor group 608 can use his computing device 200 to communicate with other supervisors from other contractor groups 608 by selecting the relevant checkboxes 702. For example, if the supervisor wants to communicate with only one other supervisor, he selects the checkbox 702a of that other supervisor. This allows the supervisor to selectively choose who the recipients of his messages are. FIG. 12B is an image of a screen 720 of the exchange environment 700 showing the transmission of messages among the contractor groups 608. The supervisor may also choose to broadcast his message to all the contractor groups 608 in a public communication exchange 704, instead of selecting individual recipients. This is as shown in a screen 730 in FIG. 12C. Other than text messages, the exchange environment 700 also allows for the sharing of computer media, such as photos, images, audios, and videos.

An advantage of the exchange environment 700 in the computing devices 200 and 240 is that the users of the computing devices 200 and 240 can transmit messages and seek answers to questions that the users may have. For example, of a supervisor of the contractors 120 using the computing device 200 is unsure of what to do, possibly due to unforeseen circumstances at the site location 140, the supervisor can message other supervisors or the main contractor office 160 via the exchange environment 700. The contractors 120 may also communicate directly with the property officers 230 to ensure that the tasks can be performed to a reasonable standard and to reduce hassles during the subsequent inspection process. Such communication could help the contractors 120 resolve issues that may occur when they are performing the work orders at the site location 140, and also to gather information from the property officer 230 as to what to look out for when working the tasks. The computing devices 200 and 240 can also communicate messages with the remote computing system 130 of the town council 110 using the exchange environment 700. This can be to report that the contractor's 120 tasks are completed,

or to report that the property officer's 230 inspection job is done. The exchange environment 700 thus allows for real-time communication among the contractors 120, property officer 230, and the town council 110.

The use of the computing devices 200 and 240 further simplifies the interaction between the various parties and can lead to improved efficiency when executing the work orders. For example, once the contractors 120 have completed a work order at a site location 140, the completion is quickly communicated to the town council 110 and eventually to the property officer 230, who can then be quickly despatched to inspect the site location 140. The overall time taken from working the tasks and inspecting the tasks is substantially reduced. This advantageously also allows for the contractors 120 to move on to other residential areas or site locations 140 to perform other work orders. In short, there can be more work orders completed within a shorter period of time, thereby improving the efficiency of the management of residential areas under the constituency of the town council 110.

In the foregoing detailed description, embodiments of the present disclosure in relation to a system and methods for managing work orders at a site location are described with reference to the figures. Description of the various embodiments in the detailed description is not intended to callout specific or particular representations of the present disclosure, but merely to illustrate non-limiting examples of the present disclosure. For example, the system and methods described in the present disclosure may also be used between or among large organizations, between or among departments within the same organization, as well as between or among users within the same department of the same organization. The present disclosure serves to address at least some of the mentioned problems and issues. Although only some embodiments of the present invention are disclosed herein, it will be apparent to a person having ordinary skill in the art in view of this disclosure that numerous changes and/or modifications can be made to the disclosed embodiments without departing from the scope of the present invention. The scope of the disclosure as well as the scope of the following claims is not limited to embodiments described herein.

Claims

1. A system for managing work orders at a site location, the system comprising:

a remote computing system for communicating a work order comprising a set of tasks associated therewith to be executed at the site location; and

a computing device located away from and communicable with the remote computing system, the computing device configured for receiving the work order being in an inaccessible state, wherein the computing device is configured to generate geolocation data of the computing device in response to the computing device detecting a first user action thereon,

wherein the set of tasks associated with the work order becomes accessible on the computing device in response to the location of the computing device being determined to be the site location,

wherein the location of the computing device is determined by verifying the generated geolocation data against a reference data, the reference data is associated with the site location; and

wherein the system is configured to render the set of tasks associated with the work order becoming accessible in the absence of the generated geolocation data by way of generating a machine data from a machine-readable object disposed at the site location and verifying the generated machine data against the reference data bypassing a need to verify the geolocation data against the reference data.

2. The system as in claim 1, wherein the verification against the reference data is processed by the computing device.

3. The system as in claim 1, wherein the verification against the reference data is processed by the remote computing system in response to transmission of the geolocation data and/or the machine data from the computing device to the remote computing system.

4. The system as in claim 1 further comprising a first of the computing device operable by a first user, and a second of the computing device operable by a second user.

5. The system as in claim 4, wherein the first computing device communicates a first action data in response to the set of tasks being performed by the first user.

6. The system as in claim 5, wherein the second computing device communicates a second action data in response to the performed set of tasks being inspected by the second user.

7. The system as in claim 1, wherein the computing device is configured to communicate an incident report to the remote computing system, the incident report being associated with at least one of the set of tasks and the site location.

8. The system as in claim 1, wherein the computing device is configured to communicate messages with the remote computing system.

9. The system as in claim 4, wherein the first and second computing devices are configured to allow communication of messages between the first and second users.

10. The system as in claim 1, wherein the set of tasks associated with the work order is inaccessible if the location of the computing device is not determined to be the site location based on the geolocation data and/or the machine data.

11. A method for managing work orders at a site location by a user, the method comprising:

receiving a work order on a computing device from a remote computing system, the computing device located away from the remote computing system, the

computing device operable by the user, the work order comprising a set of tasks to be performed at the site location, the set of tasks being in an inaccessible state on the computing device;

detecting a first user action on the computing device;

triggering an unlocking process towards the set of tasks of the work order in response to detecting the first user action, the unlocking process comprising generating geolocation data by the computing device; and

transitioning the set of tasks from the inaccessible state to an accessible state if the location of the computing device is determined to be the site location,

wherein the location of the computing device is determined by verifying the generated geolocation data against a reference data, the reference data is associated with the site location,

wherein the computing device is configured to render the set of tasks associated with the work order becoming accessible in the absence of the generated geolocation data by way of generating a machine data from a machine-readable object disposed at the site location and verifying the generated machine data against the reference data bypassing a need to verify the geolocation data against the reference data.

12. The method as in claim 11, further comprising maintaining the set of tasks in the inaccessible state if the location of the computing device is not determined to be the site location based on both the geolocation data and the machine data.

13. The method as in claim 11, further comprising transmitting at least one of the geolocation data and the machine data from the computing device to the remote computing system for determining the location of the computing device.

14. The method as in claim 11, further comprising detecting a second user action by the user on the computing device after the set of tasks has been performed by the user and communicating an action data from the computing device to the remote

computing system in response to the computing device detecting the second user action.

15. The method as in claim 11, further comprising communicating messages between the computing device and at least one of the remote computing system and a second computing device.

16. A method for managing work orders at a site location by a user, the method comprising:

receiving an inspection work order on a computing device from a remote computing system, the computing device located away from the remote computing system, the computing device operable by the user, the inspection work order comprising a set of tasks to be performed at the site location, the set of tasks being in an inaccessible state on the computing device;

detecting a first user action on the computing device;

triggering an unlocking process towards the set of tasks of the inspection work order in response to detecting the first user action, the unlocking process comprising generating geolocation data by the computing device; and

transitioning the set of performed tasks from the inaccessible state to an accessible state if the location of the computing device is determined to be the site location,

wherein the location of the computing device is determined by verifying the generated geolocation data against a reference data, the reference data is associated with the site location,

wherein the computing device is configured to render the set of tasks associated with the inspection work order becoming accessible in the absence of the generated geolocation data by way of generating a machine data from a machine-readable object disposed at the site location and verifying the generated machine data against the reference data bypassing a need to verify the geolocation data against the reference data.

17. The method as in claim 16, further comprising maintaining the set of tasks in the inaccessible state if the location of the computing device is not determined to be the site location based on the geolocation data and/or the machine data.

18. The method as in claim 16, further comprising detecting a second user action by the user on the computing device after the set of performed tasks has been inspected by the user.

19. The method as in claim 18, further comprising communicating an action data from the computing device in response to the computing device detecting the second user action.

20. The method as in claim 16, further comprising generating an incident report on the computing device, the incident report being associated with at least one of the set of performed tasks and the site location, the incident report being communicable to the remote computing system.

SYSTEM AND METHODS FOR MANAGING WORK ORDERS AT A SITE LOCATION

Abstract

The present disclosure generally relates to a system and methods for managing work orders at a site location. In an aspect of the present disclosure, there is provided a system for managing work orders at a site location. The system comprises: a remote computing system for communicating a work order comprising a set of tasks associated therewith to be executed at the site location; and a computing device located away from and communicable with the remote computing system, the computing device configured for accessing the work order. The computing device is configured to generate at least one of: geolocation data of the computing device; and machine data obtained from a machine-readable object disposed at the site location, in response to the computing device detecting a first user action thereon. A location of the computing device is determined based on the at least one of the geolocation data and the machine data. The set of tasks associated with the work order is accessible on the computing device in response to the location of the computing device being determined to be the site location.

FIG. 1

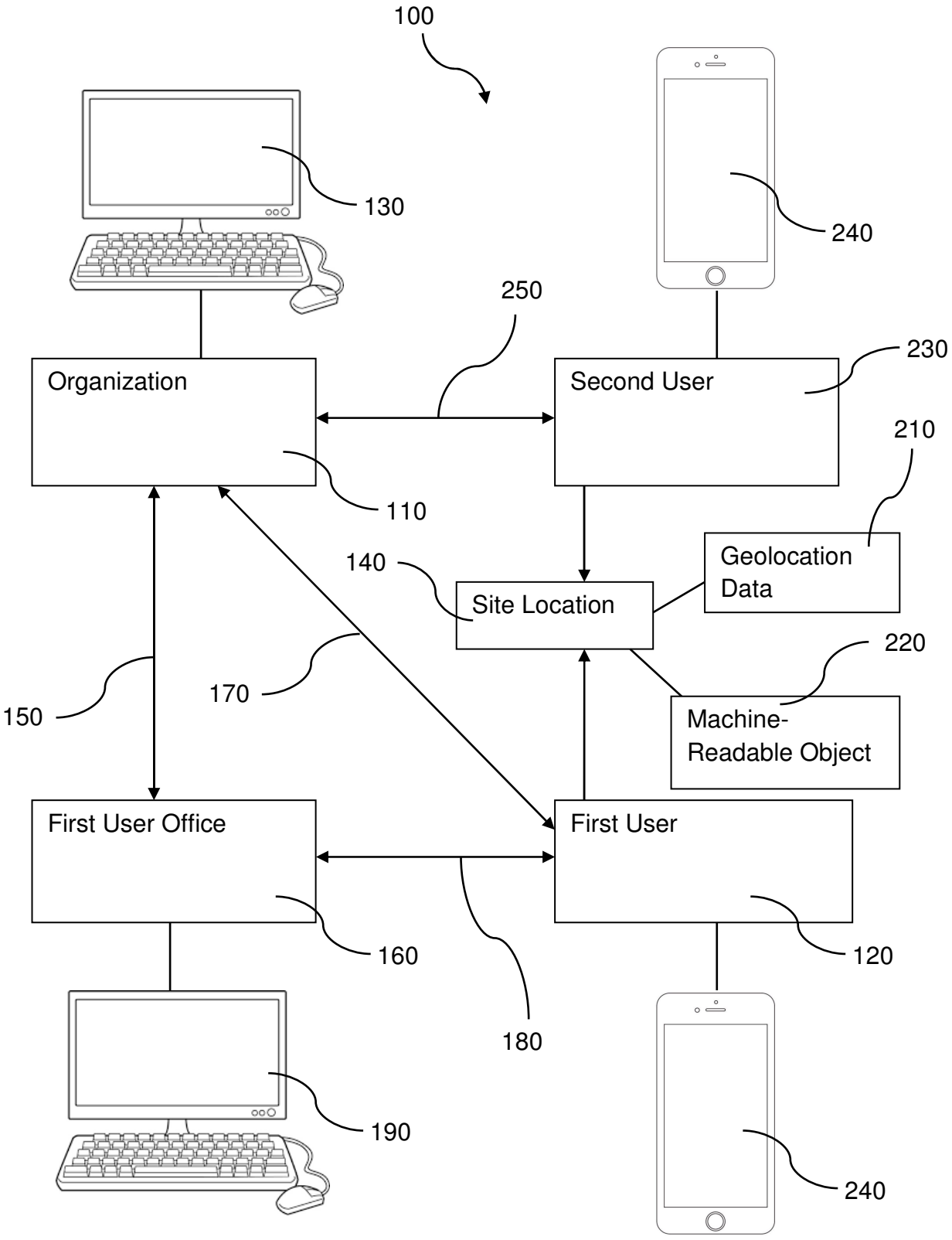

100
130
240
250
230
Organization
Second User
210
110
140
Geolocation Data
Site Location
220
170
150
Machine-Readable Object
First User Office
First User
160
120
180
190
240

FIG. 1

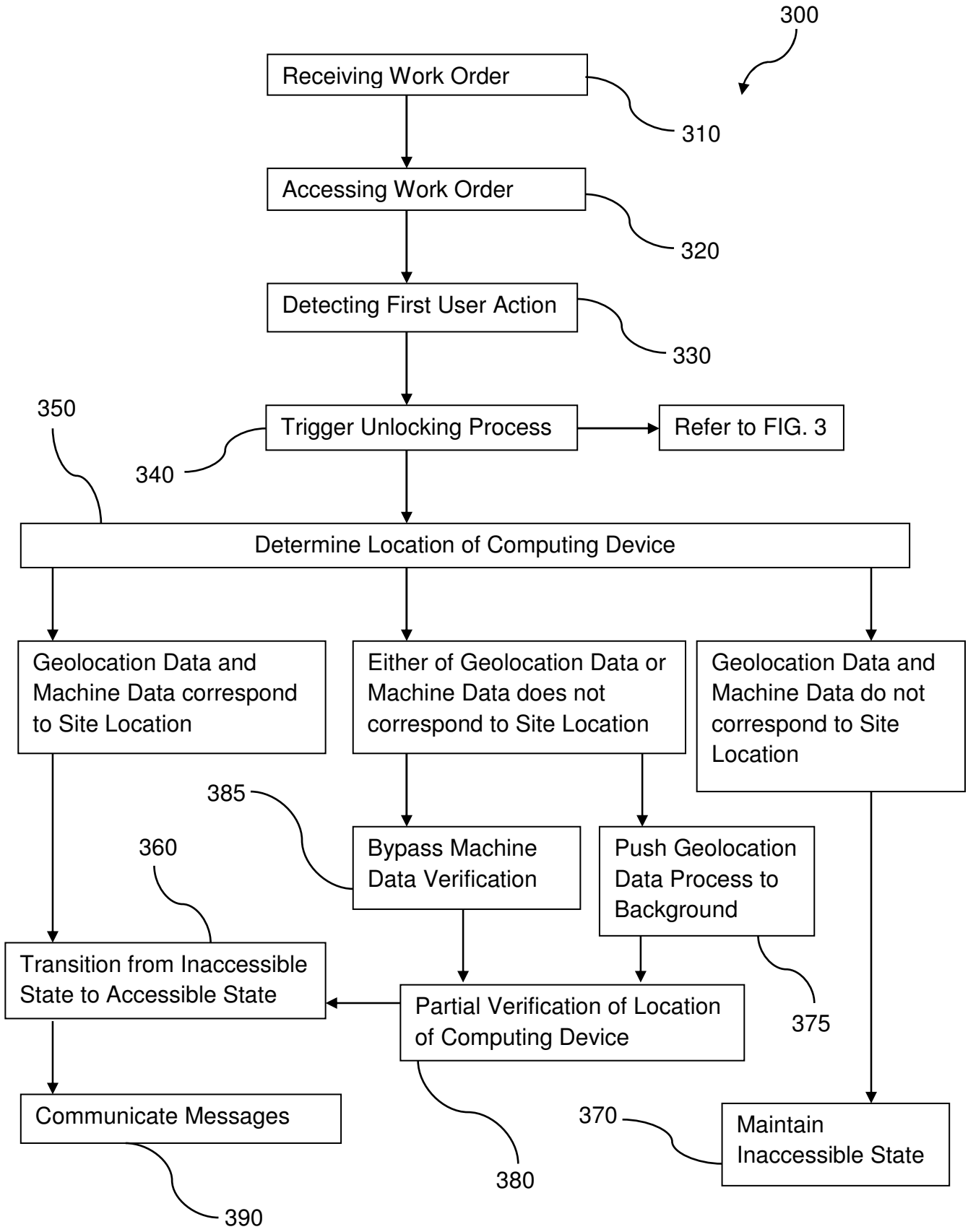

300
Receiving Work Order
310
Accessing Work Order
320
Detecting First User Action
330
350
Trigger Unlocking Process
340
Refer to FIG. 3
Determine Location of Computing Device
Geolocation Data and Machine Data correspond to Site Location
Either of Geolocation Data or Machine Data does not correspond to Site Location
Geolocation Data and Machine Data do not correspond to Site Location
385
Bypass Machine Data Verification
Push Geolocation Data Process to Background
360
Transition from Inaccessible State to Accessible State
Partial Verification of Location of Computing Device
375
Communicate Messages
380
370
Maintain Inaccessible State
390

FIG. 2

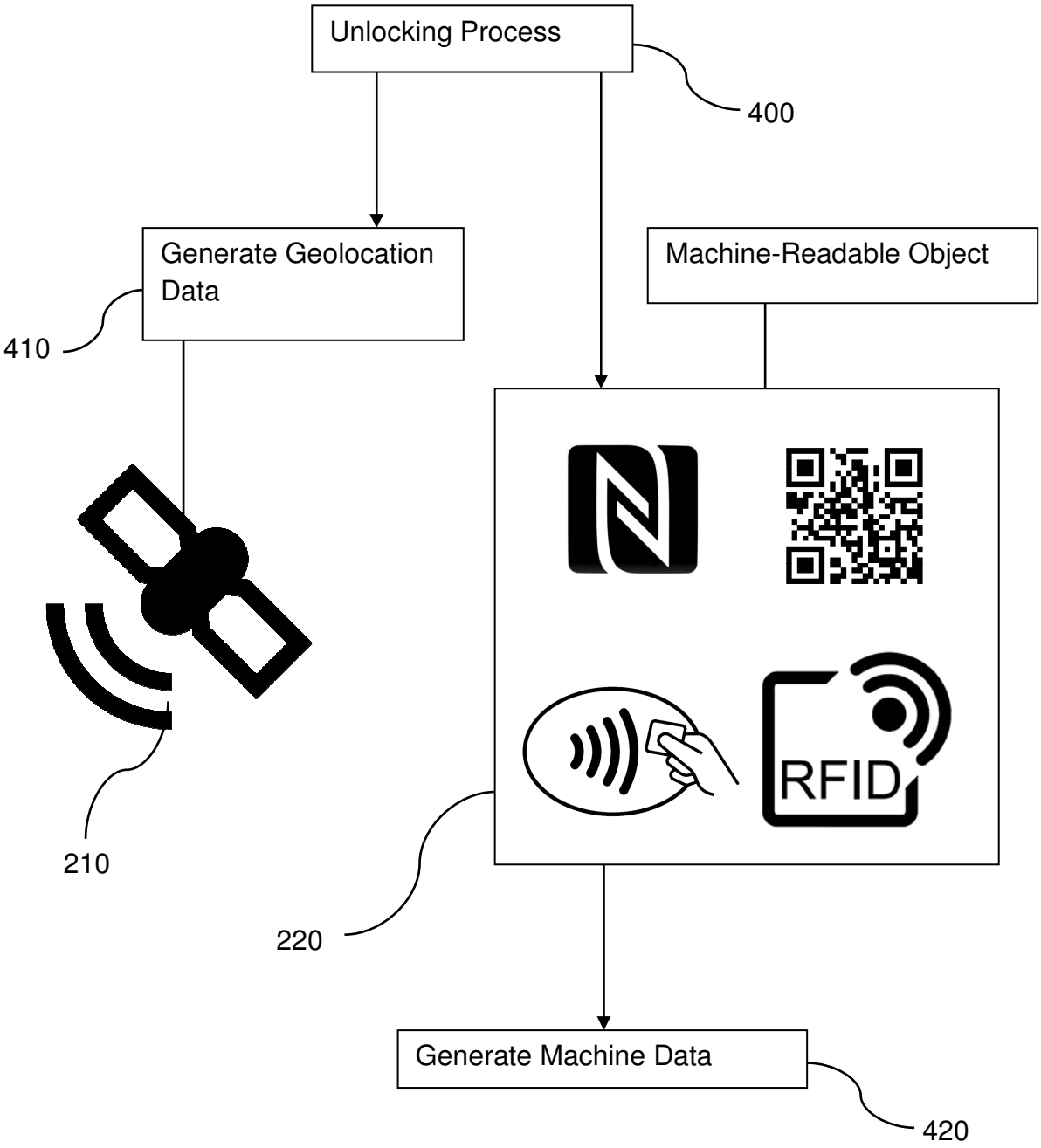

Unlocking Process
400
Generate Geolocation Data
410
Machine-Readable Object
210
220
RFID
Generate Machine Data
420

FIG. 3

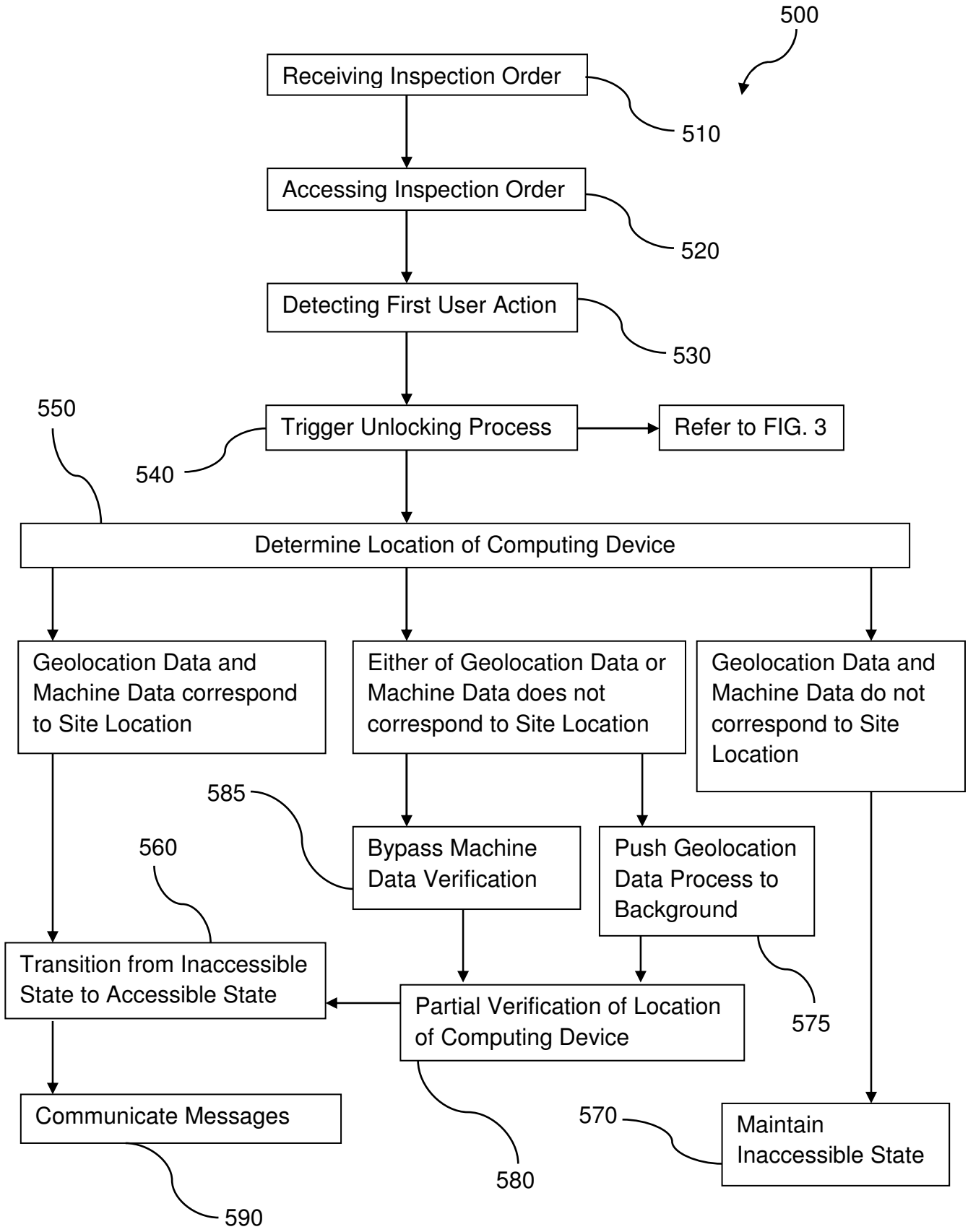

500
Receiving Inspection Order
510
Accessing Inspection Order
520
Detecting First User Action
530
550
Trigger Unlocking Process
Refer to FIG. 3
540
Determine Location of Computing Device
Geolocation Data and Machine Data correspond to Site Location
Either of Geolocation Data or Machine Data does not correspond to Site Location
Geolocation Data and Machine Data do not correspond to Site Location
585
Bypass Machine Data Verification
Push Geolocation Data Process to Background
560
Transition from Inaccessible State to Accessible State
Partial Verification of Location of Computing Device
575
Communicate Messages
580
570
Maintain Inaccessible State
590

FIG. 4

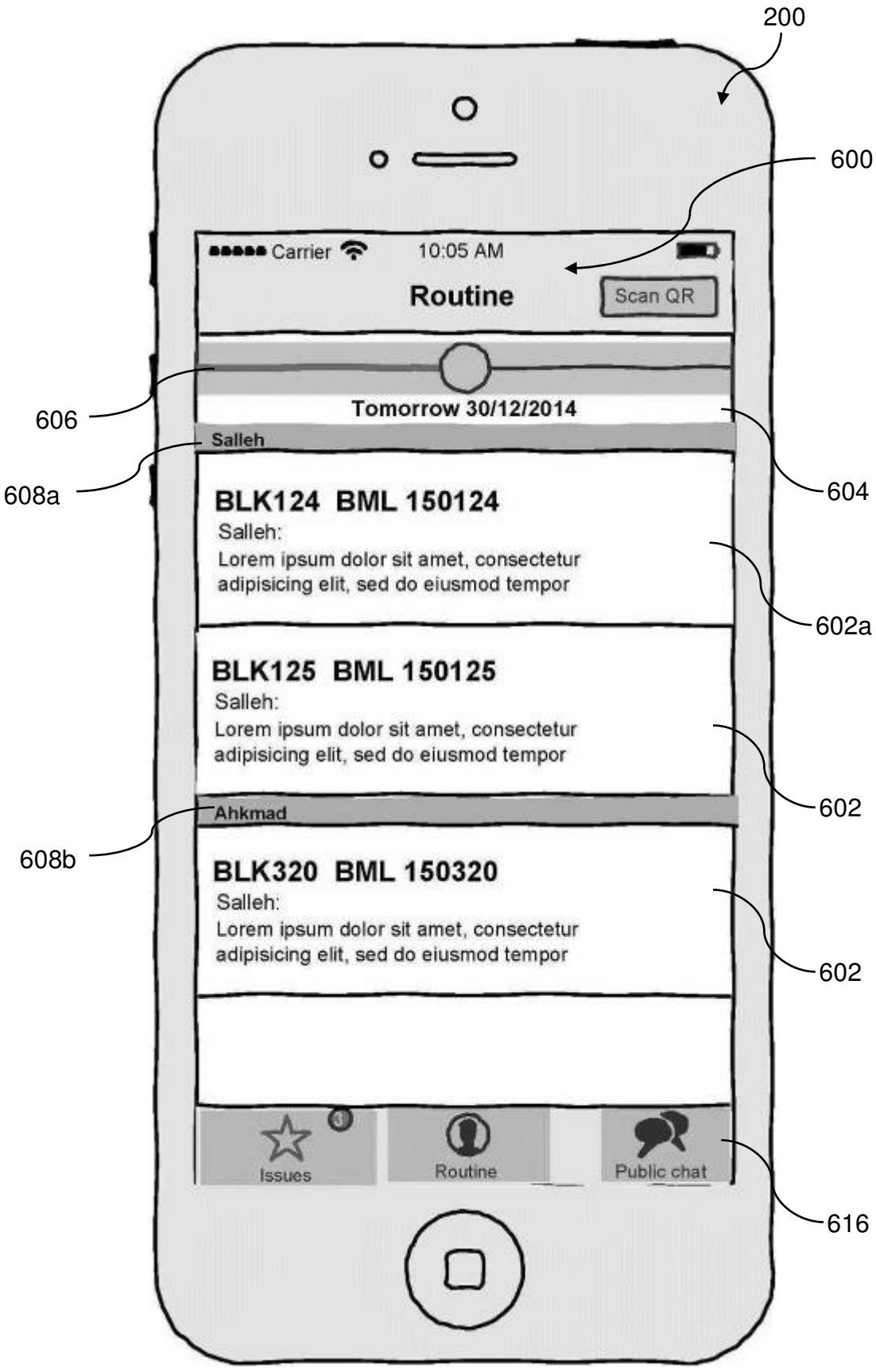

200
600
Carrier
10:05 AM
Routine
Scan QR
606
Tomorrow 30/12/2014
Salleh
608a
604
BLK124 BML 150124
Salleh:
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor
602a
BLK125 BML 150125
Salleh:
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor
602
Ahkmad
608b
BLK320 BML 150320
Salleh:
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor
602
Issues
Routine
Public chat
616

FIG. 5A

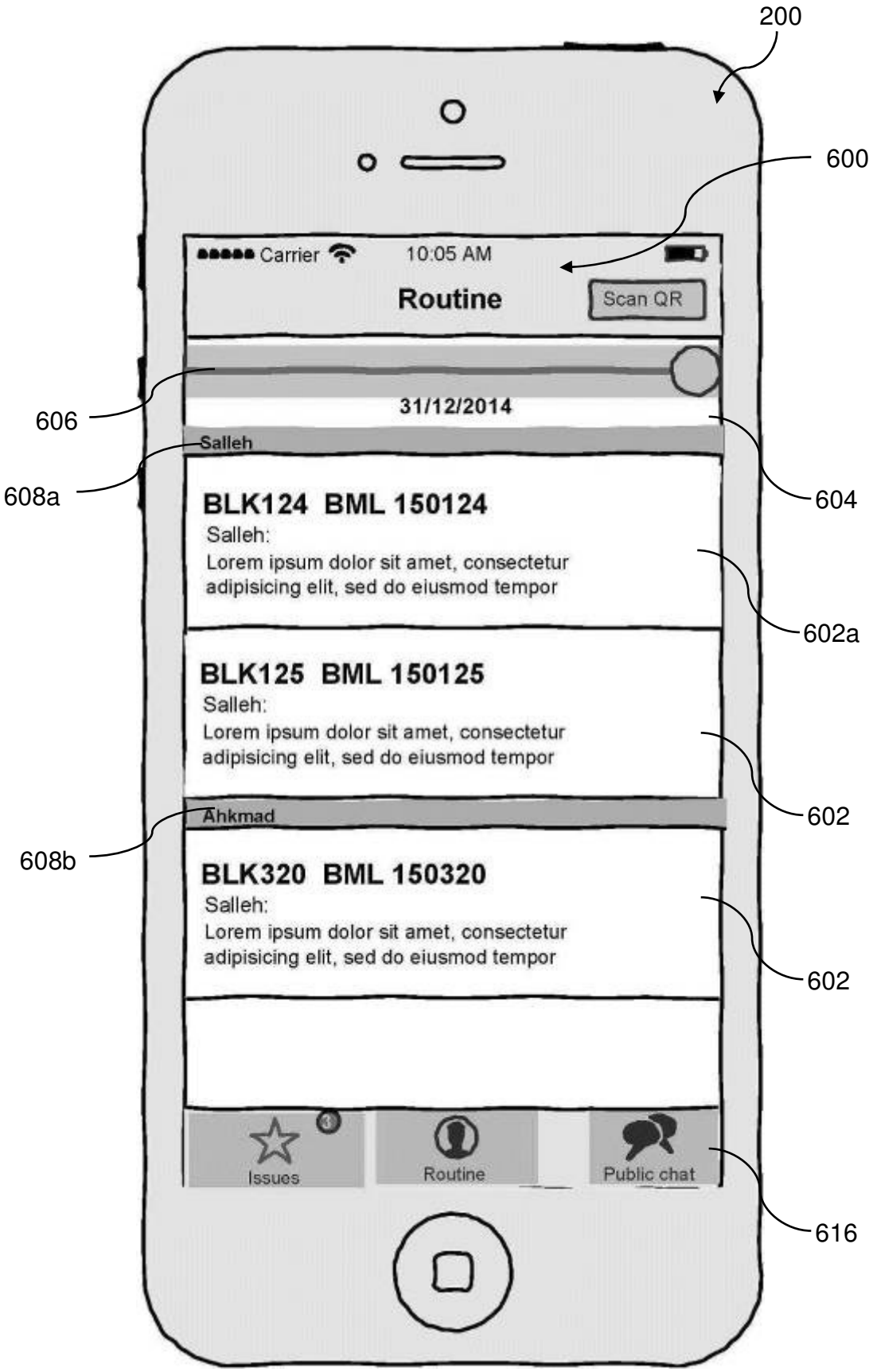

200
600
Carrier
10:05 AM
Routine
Scan QR
606
31/12/2014
Salleh
608a
604
BLK124 BML 150124
Salleh:
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor
602a
BLK125 BML 150125
Salleh:
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor
602
Ahkmad
608b
BLK320 BML 150320
Salleh:
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor
602
Issues
Routine
Public chat
616

FIG. 5B

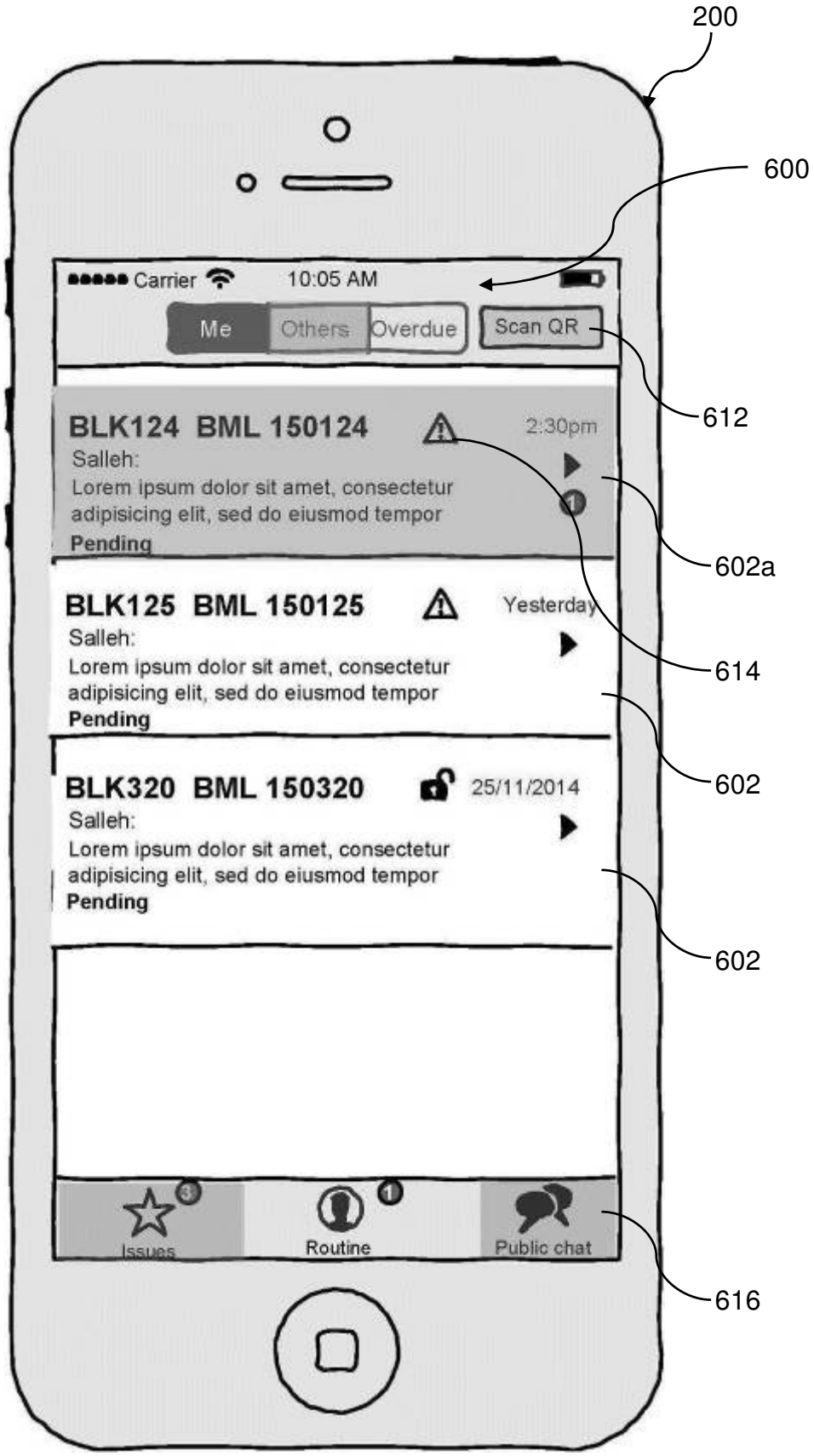

200
600
Carrier
10:05 AM
Me
Others
Overdue
Scan QR
612
BLK124 BML 150124
2:30pm
Salleh:
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor
Pending
602a
BLK125 BML 150125
Yesterday
Salleh:
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor
Pending
614
602
BLK320 BML 150320
25/11/2014
Salleh:
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor
Pending
602
Issues
Routine
Public chat
616

FIG. 6

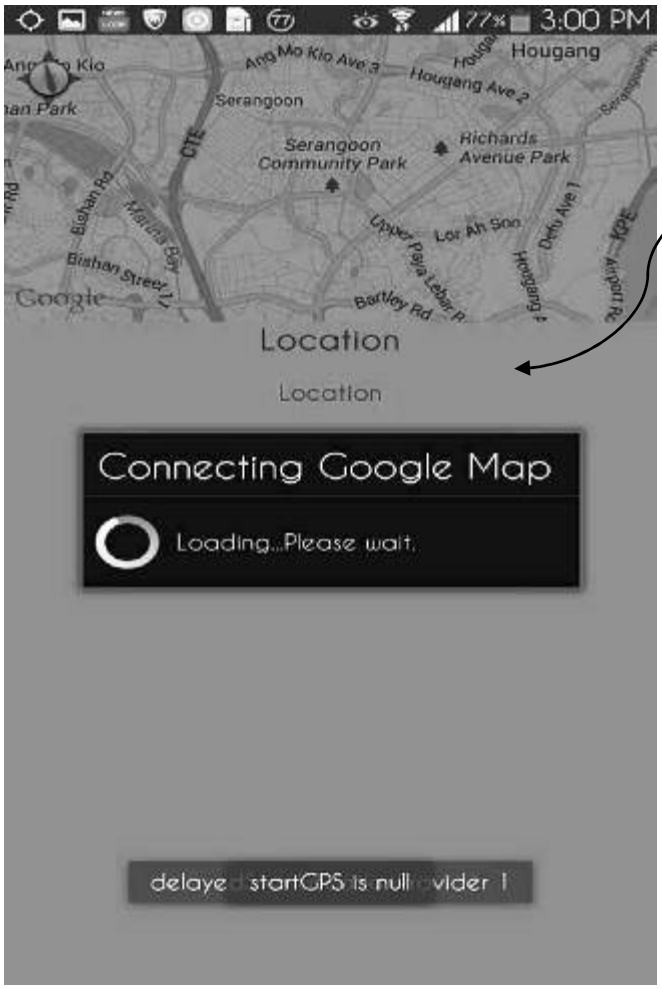

3:00 PM
Hougang
Ang Mo Kio Ave 3
Hougang Ave 2
Serangoon
Serangoon Community Park
Richards Avenue Park
CTE
Bishan Rd
Marina Bay
Bishan Street 11
Google
Upper Paya Lebar R
Lor Ah Soo
Bartley Rd
Hougang 1
Defu Ave 1
KPE
Airport Rd
Location
Location
Connecting Google Map
Loading...Please wait.
delaye startGPS is null vider 1
610

FIG .7

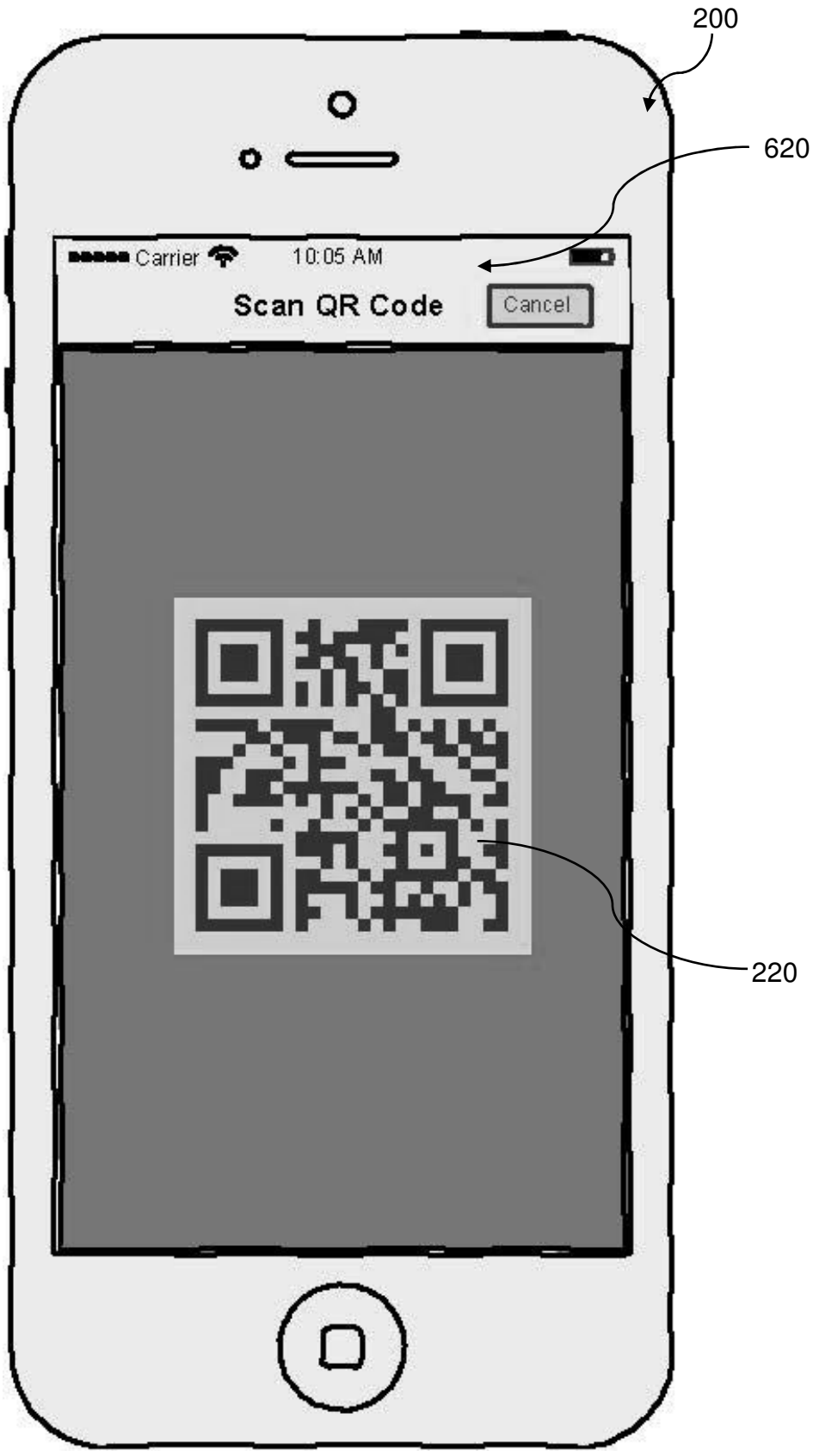


FIG. 8

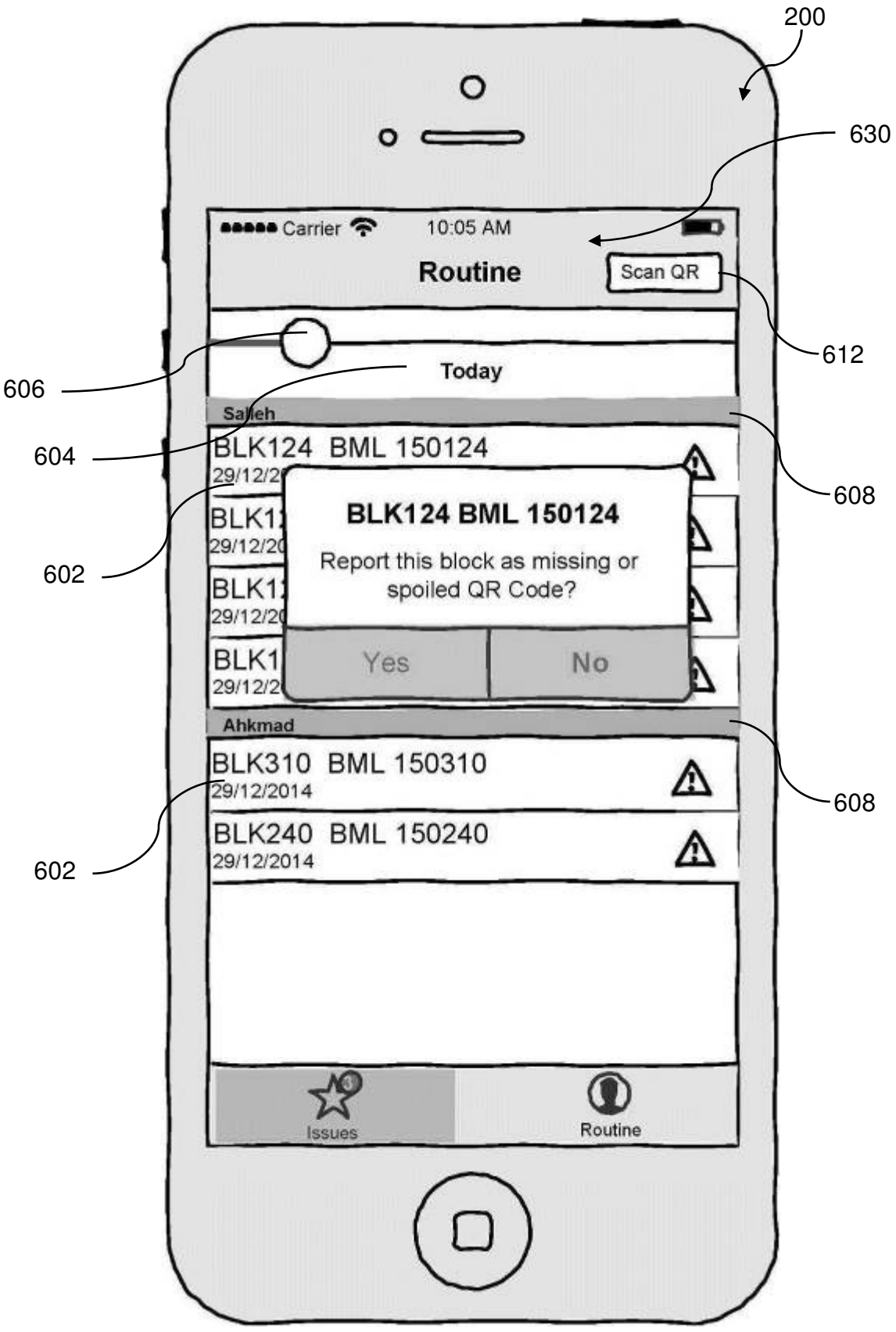

200
630
Carrier
10:05 AM
Routine
Scan QR
612
606
Today
604
Saleh
BLK124 BML 150124
608
BLK124 BML 150124
Report this block as missing or spoiled QR Code?
602
Yes
No
Ahkmad
BLK310 BML 150310
29/12/2014
608
602
BLK240 BML 150240
29/12/2014
Issues
Routine

FIG. 9

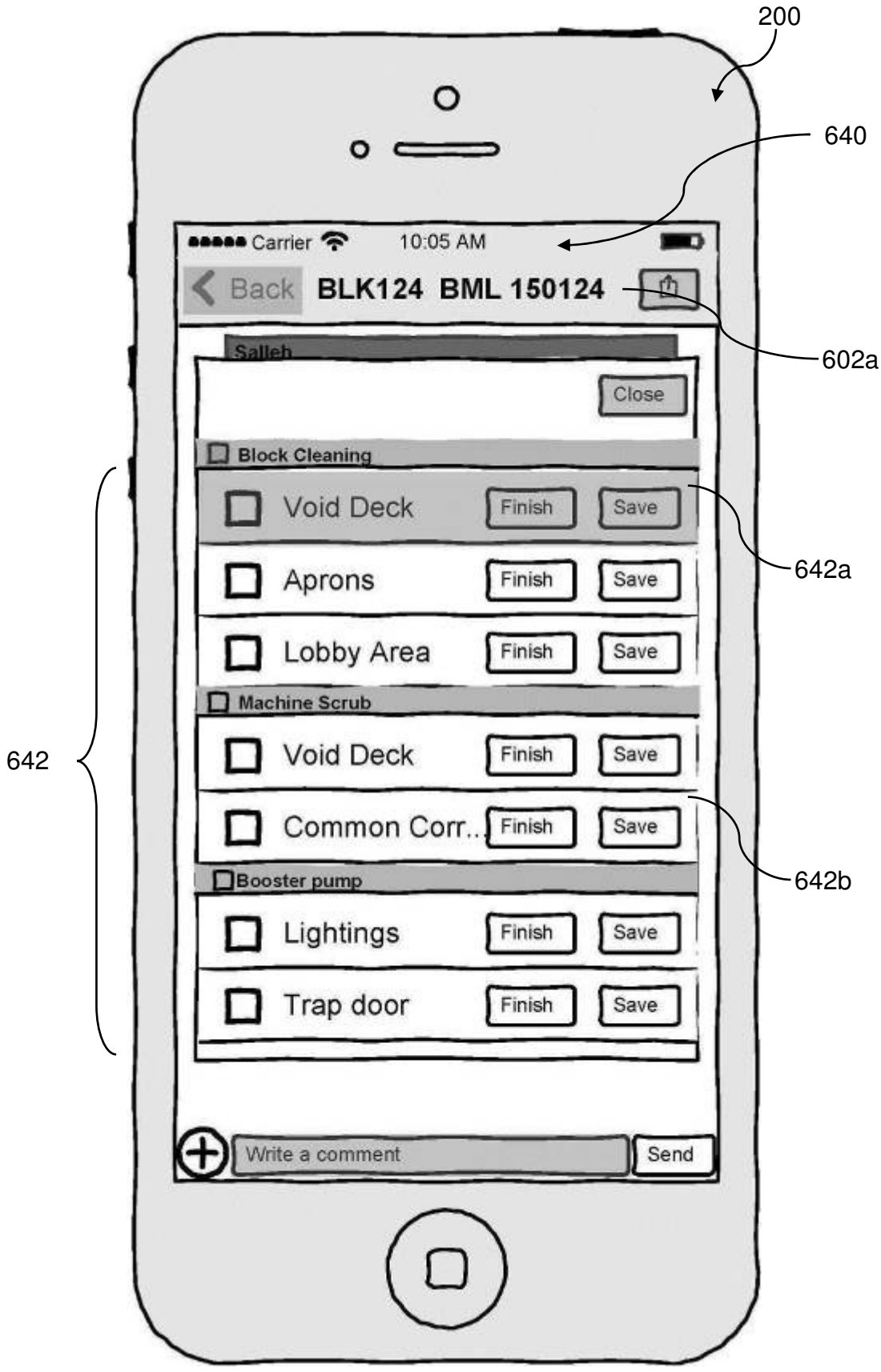

200
640
Carrier
10:05 AM
Back
BLK124 BML 150124
602a
Salleh
Close
Block Cleaning
Void Deck
Finish
Save
642a
Aprons
Finish
Save
Lobby Area
Finish
Save
Machine Scrub
642
Void Deck
Finish
Save
Common Corr..
Finish
Save
642b
Booster pump
Lightings
Finish
Save
Trap door
Finish
Save
Write a comment
Send

FIG. 10A

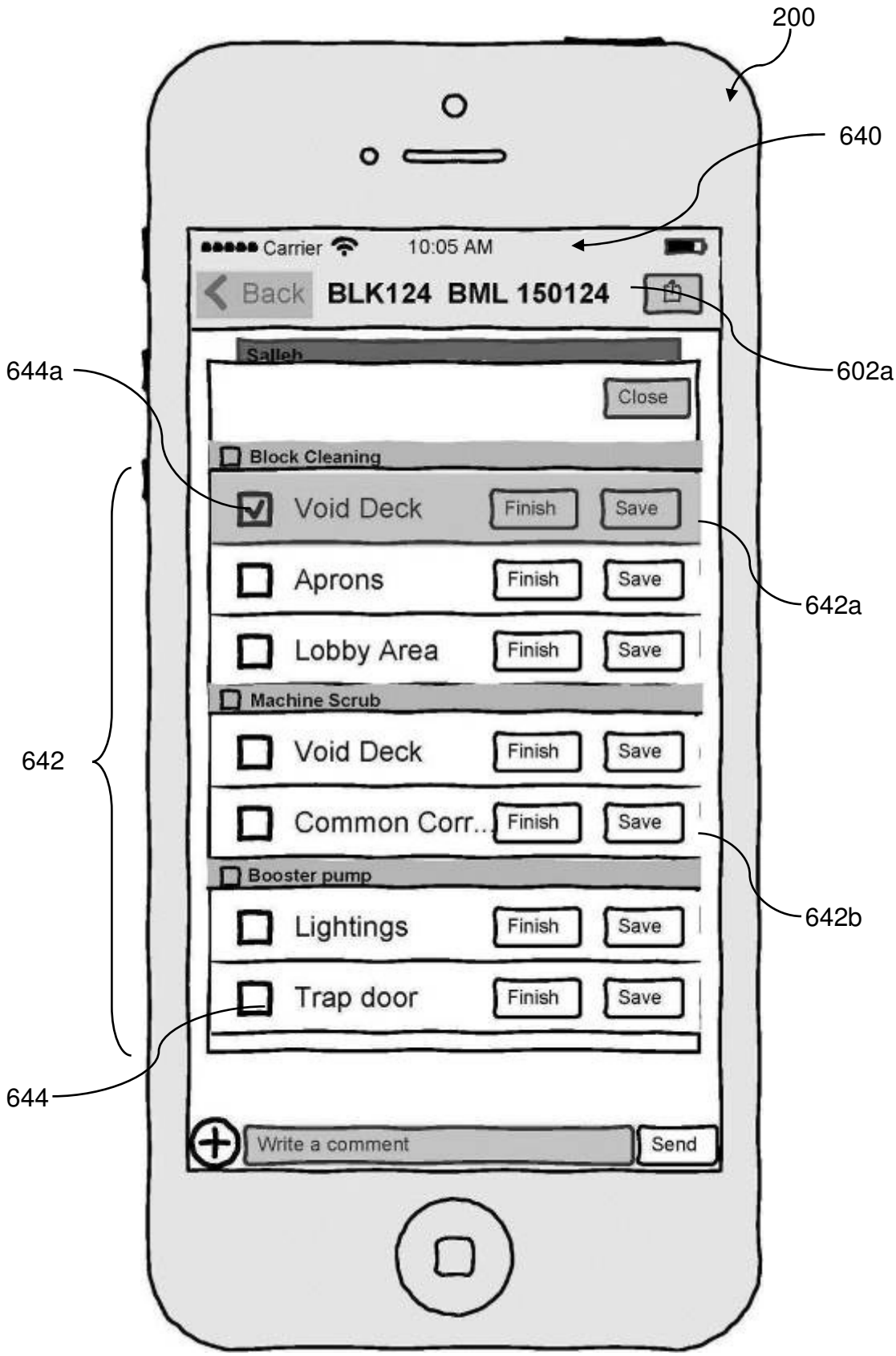

200
640
Carrier
10:05 AM
Back
BLK124 BML 150124
602a
644a
Close
Block Cleaning
Void Deck
Finish
Save
Aprons
Finish
Save
642a
Lobby Area
Finish
Save
Machine Scrub
642
Void Deck
Finish
Save
Common Corr..
Finish
Save
642b
Booster pump
Lightings
Finish
Save
Trap door
Finish
Save
644
Write a comment
Send

FIG. 10B

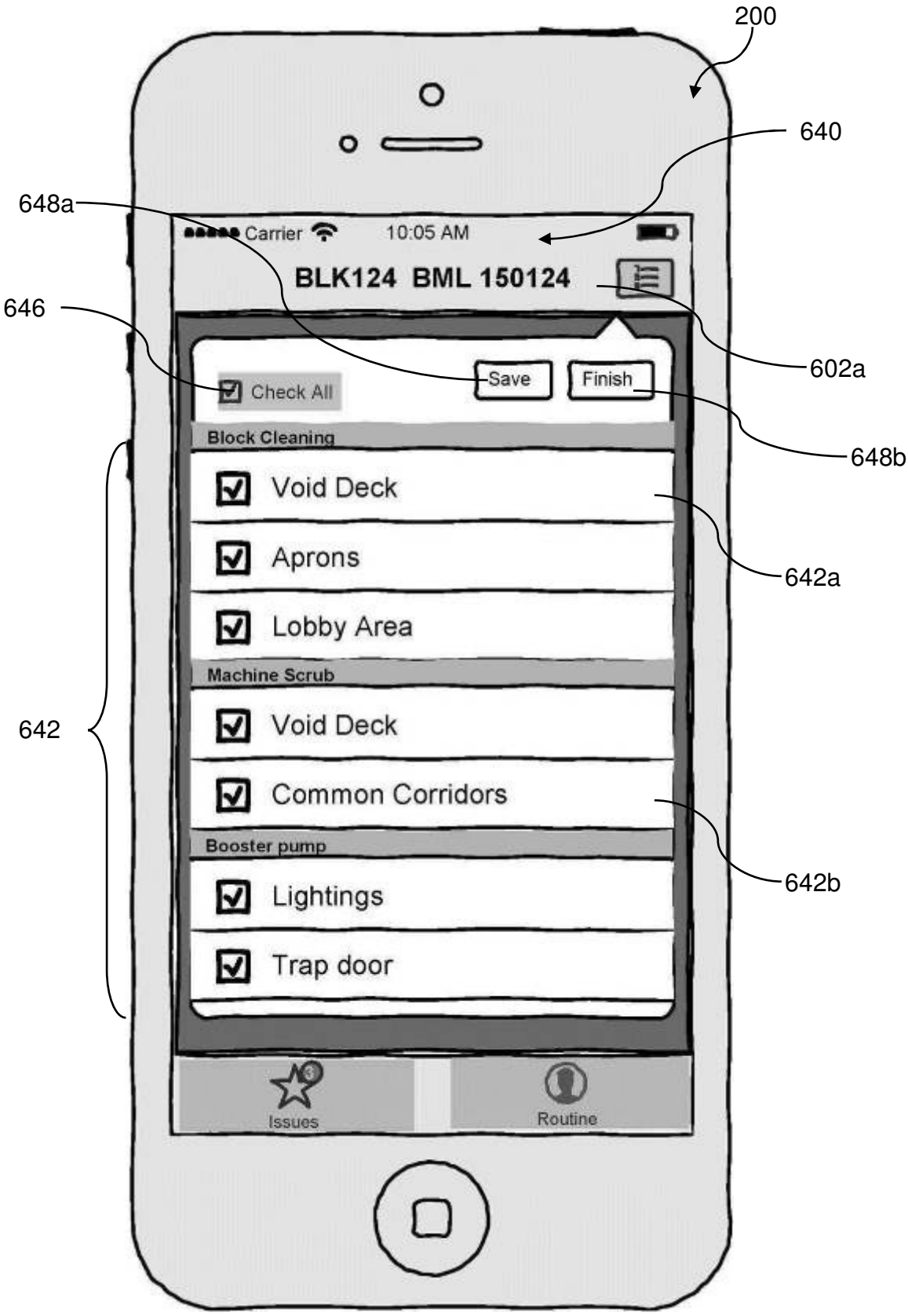

200
640
648a
646
602a
648b
642a
642
642b
Carrier
10:05 AM
BLK124 BML 150124
Check All
Save
Finish
Block Cleaning
Void Deck
Aprons
Lobby Area
Machine Scrub
Void Deck
Common Corridors
Booster pump
Lightings
Trap door
Issues
Routine

FIG. 10C

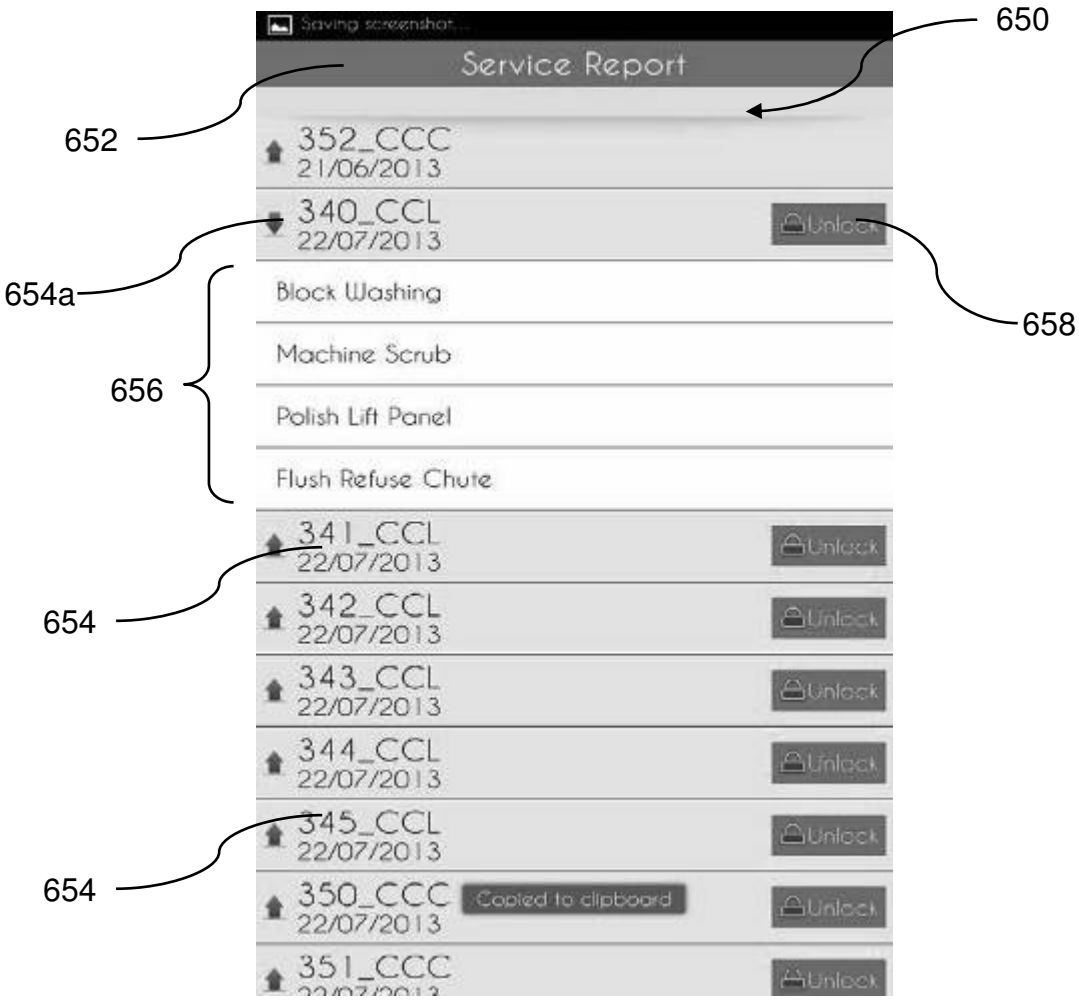

Saving screenshot...
Service Report
650
652
352_CCC
21/06/2013
340_CCL
22/07/2013
Unlock
654a
658
Block Washing
Machine Scrub
656
Polish Lift Panel
Flush Refuse Chute
341_CCL
22/07/2013
654
342_CCL
22/07/2013
343_CCL
22/07/2013
344_CCL
22/07/2013
345_CCL
22/07/2013
654
350_CCC
22/07/2013
Copied to clipboard
351_CCC

FIG. 11A

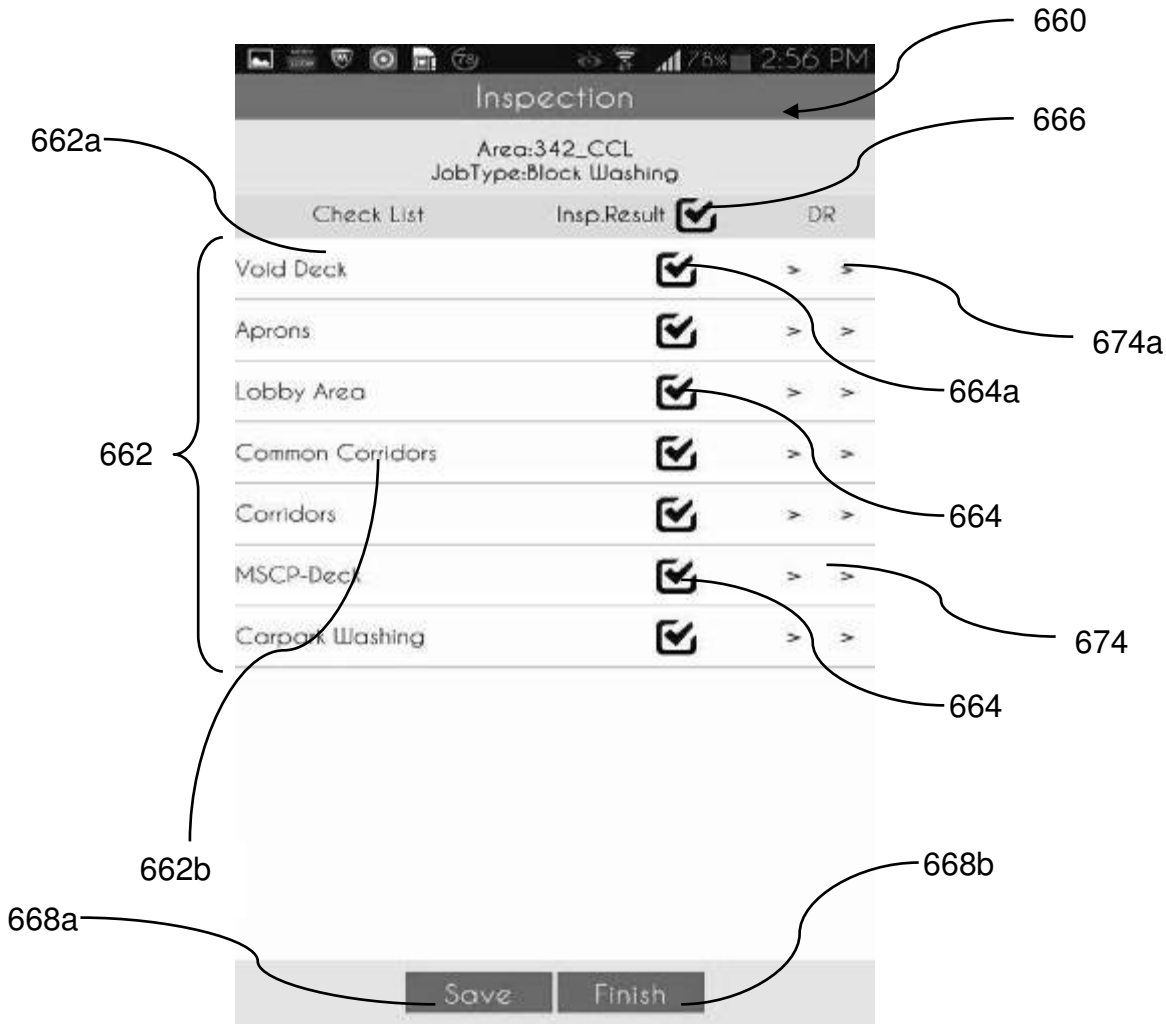


FIG. 11B

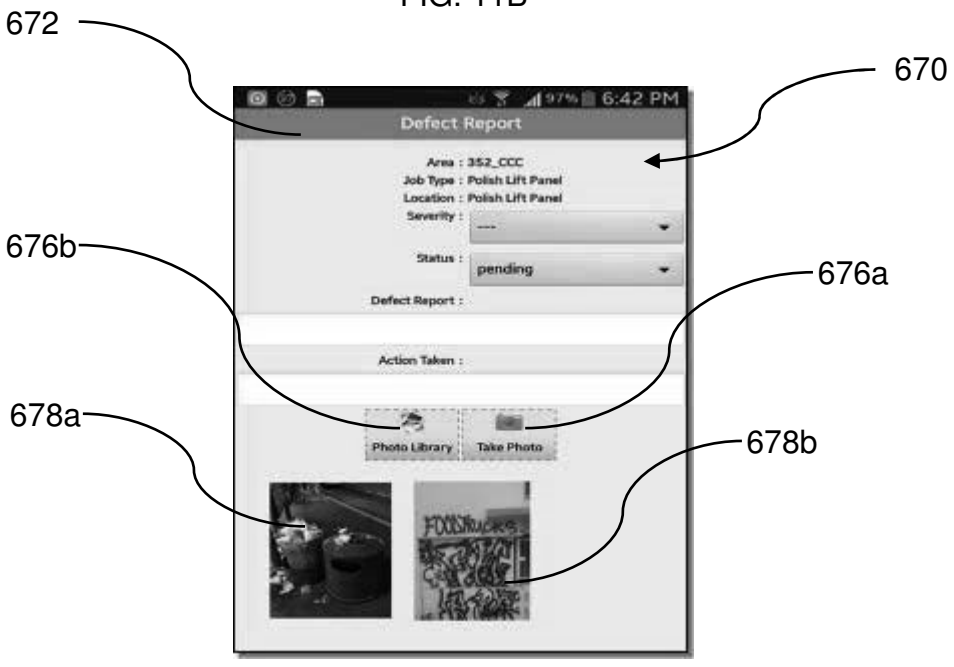


FIG. 11C

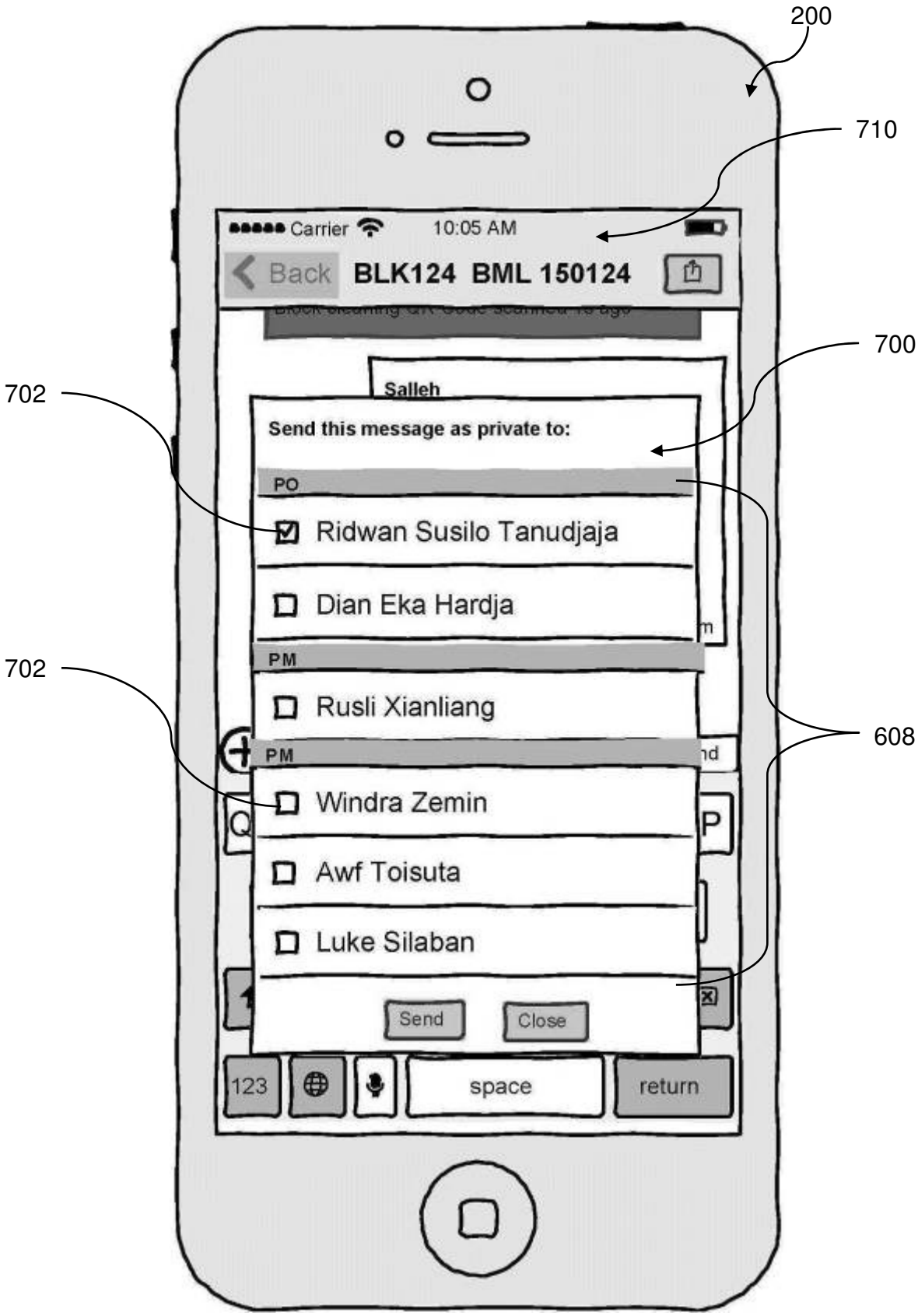

200
710
700
702
702
608
Carrier
10:05 AM
Back
BLK124 BML 150124
Salleh
Send this message as private to:
PO
Ridwan Susilo Tanudjaja
Dian Eka Hardja
PM
Rusli Xianliang
PM
Windra Zemin
Awf Toisuta
Luke Silaban
Send
Close
123
space
return

FIG. 12A

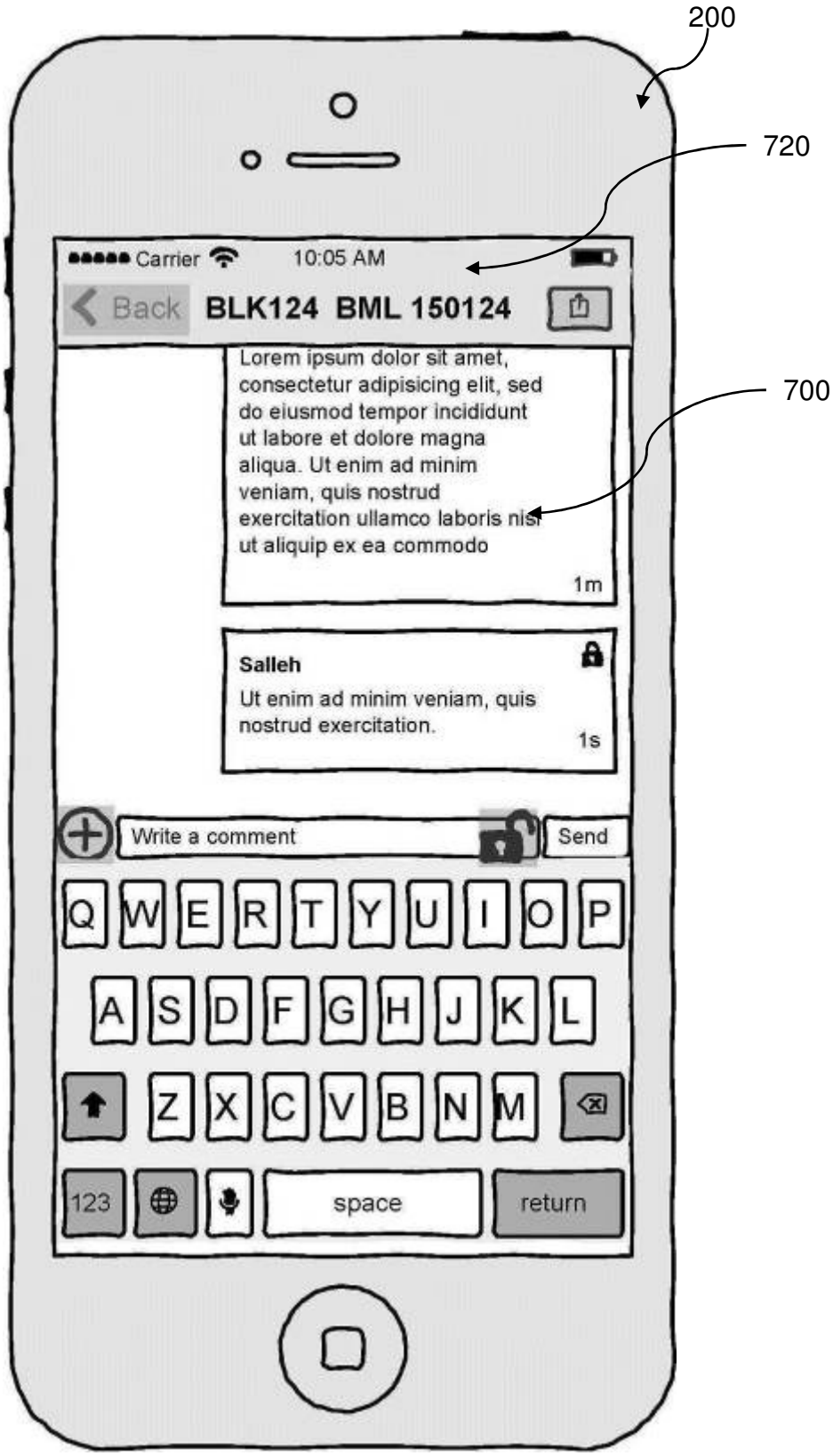

200
720
700
Carrier
10:05 AM
Back
BLK124 BML 150124
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo
1m
Salleh
Ut enim ad minim veniam, quis nostrud exercitation.
1s
Write a comment
Send
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
123
space
return

FIG. 12B

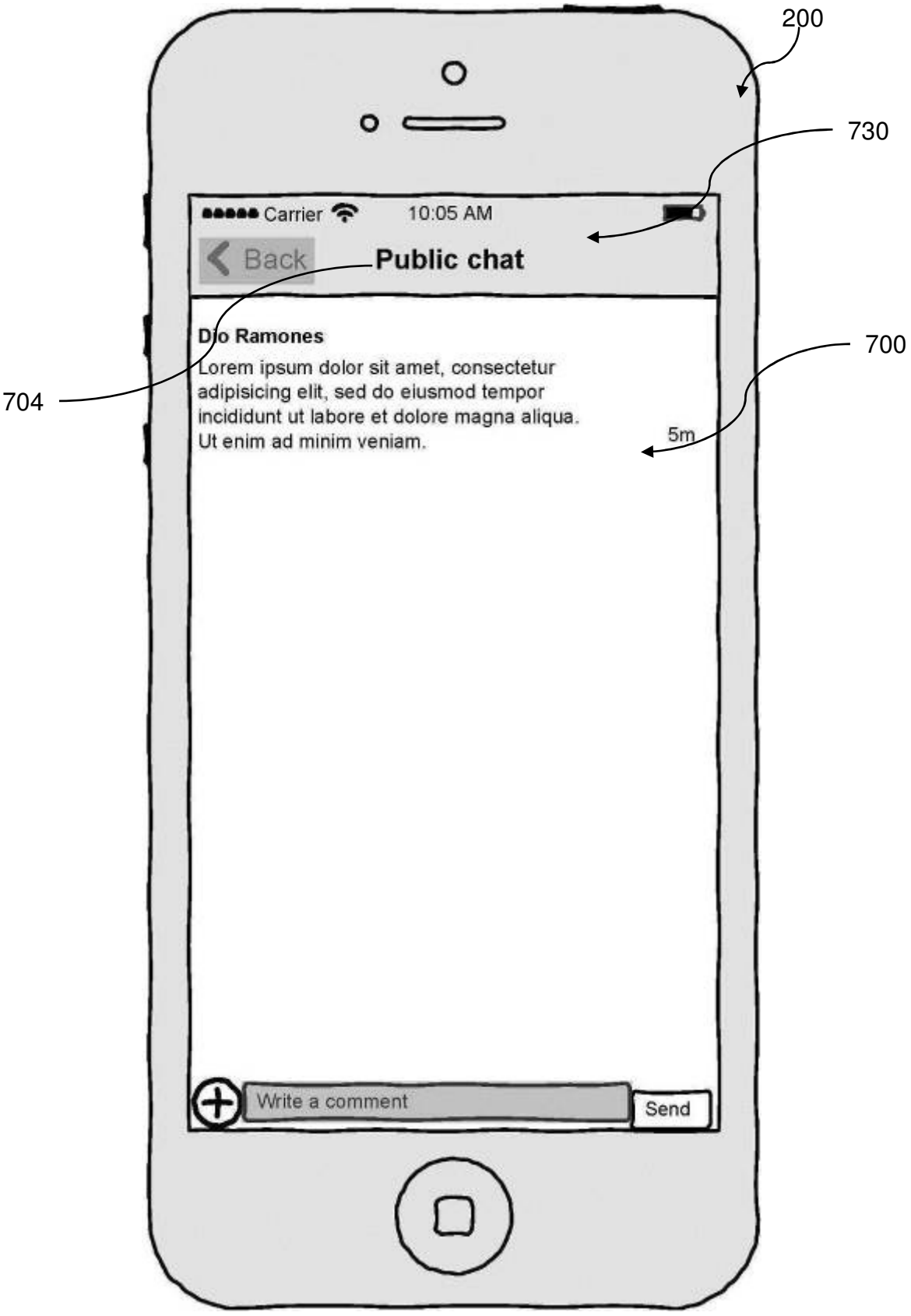

200
730
Carrier
10:05 AM
Back
Public chat
704
Dio Ramones
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam.
700
5m
Write a comment
Send

FIG. 12C