

ELECTRONIC APPARATUS FOR MANAGING WORKING INFORMATION AND METHOD THEREOF

Technical Field

5 **[0001]** The present disclosure relates to an electronic apparatus for managing working information and a method thereof.

Background Art

10 **[0002]** With the development of electronic technology, e-commerce has earned its place in the field of shopping. A customer may purchase an item online without going to a shopping mall or market directly, and an item purchased online is delivered to a delivery destination requested by a customer.

15 **[0003]** In the case of such an e-commerce transaction, a speed of item delivery has a significant impact on service satisfaction, and discussions on various ways to deliver items to customers more quickly are underway. As one method for such rapid delivery, fulfillment centers are being provided in various regions. A fulfillment center stores a variety of items sold online, and when an item is purchased, delivery is made to a customer at a fulfillment center near the customer who purchased the item. That is, a delivery period is shortened by placing items in various regions before the items are purchased and then shipping the items from a fulfillment center adjacent to a customer's location when the purchase occurs.

20 **[0004]** On the other hand, for a plurality of workers who display items at each fulfillment center or collect and move the displayed items, there may be a need to manage and supervise working statuses of each worker, and call the workers or provide feedback to the workers, if necessary.

Disclosure of Invention

25 **Technical Goals**

30 **[0005]** The present disclosure is directed to providing an electronic apparatus for allowing a company to effectively manage and supervise working statuses of workers and rapidly and easily provide feedback to workers with low working efficiency by checking working progress status information of one or more workers, selecting a target worker in response to the working progress status information, and providing an alarm to a terminal of the selected target worker, and a method thereof.

[0006] The technical goals to be achieved by the embodiments of the present disclosure are not limited to the technical goals described above, and other technical goals may be inferred from the following example embodiments.

Technical solutions

5 **[0007]** According to an aspect of the present disclosure, there is provided a method of managing working information in an electronic apparatus, the method including receiving first information related to execution of work from one or more terminals related to one or more workers, checking working progress status information of at least some of the one or more workers based on the first information, selecting a
10 target worker from the one or more workers based on the working progress status information, and transmitting second information providing an alarm to a terminal of the selected target worker.

[0008] The terminal of the target worker may be locked according to the second information.

15 **[0009]** The first information may include at least one of information on an item identified by the one or more terminals, information on a location where the identified item is arranged, a time when the information on the item is identified, and a time when the location where the item is arranged is identified.

[0010] The working progress status information may include identification information
20 of a specific worker, a number of items processed per unit time by the specific worker, and time information corresponding to an acquisition of the first information.

[0011] The work may include displaying the item at a specific location, and the first information may include information on the displayed item and information on a location where the item is displayed.

25 **[0012]** The work may include collecting an item displayed at a specific location and moving the collected item to a packing zone, and the first information may include information on the collected item and information on a location where the item is collected.

[0013] The method may further include determining whether the number of items
30 processed by a specific worker per unit time is lower than a threshold value, and the working progress status information may include information corresponding to a result of the determining.

[0014] The threshold value may be set to a different value according to a type of work of the specific worker.

[0015] The threshold value may be set to a different value depending on whether the work is performed on an individual item or is performed on a bundled item.

5 [0016] The method may further include receiving third information related to a request for help from the target worker, and the third information may be further taken into consideration to select the target worker.

[0017] A skill level of a specific worker related to the work may be taken into consideration to select the target worker.

10 [0018] The first information may be generated based on checking at least one of identification information of an item and identification information of a location by the one or more terminals.

[0019] A message may be output to the terminal, an alarm sound may be output to the terminal, or a vibration may be output to the terminal based on the second information.

15 [0020] Detailed contents of other embodiments are described in the detailed description and are illustrated in the accompanying drawings.

Effects

[0021] According to the present disclosure, an electronic apparatus for managing working information and a method thereof allow a company to effectively manage
20 and supervise the working statuses of workers and rapidly and easily provide feedback to the workers with low working efficiency by checking the working progress status information of at least one worker, selecting a target worker in response to the working progress status information, and providing an alarm to a terminal of the selected target worker.

25 [0022] In addition, according to the present disclosure, it is possible to determine whether to call the worker and provide the feedback to the worker in further consideration of various factors as well as the working efficiency by allowing the target worker to be flexibly selected according to various criteria.

[0023] Effects of the present disclosure are not limited to the above-described effects,
30 and other effects that are not described will be clearly understood by those skilled in the art from the description of the scope of the claims.

Brief Description of Drawings

[0024] FIG. 1 is a schematic configuration diagram illustrating a system for managing working information according to an example embodiment.

[0025] FIG. 2 is an operation flowchart illustrating a method of managing working information by an electronic apparatus according to an example embodiment.

5 [0026] FIG. 3 is a diagram illustrating working progress status information according to an example embodiment.

[0027] FIG. 4 is a diagram illustrating a criterion for selecting a target worker by an electronic apparatus according to an example embodiment.

10 [0028] FIG. 5 is a diagram illustrating a process of transmitting second information from the electronic apparatus to a worker terminal according to an example embodiment.

[0029] FIG. 6 is a diagram illustrating a case of selecting a target worker in consideration of a worker's skill level according to an example embodiment.

[0030] FIG. 7 is a diagram illustrating a terminal receiving second information according to an example embodiment.

15 [0031] FIG. 8 is a diagram illustrating a configuration of an electronic apparatus for managing working information according to an example embodiment.

Best Mode for Carrying Out the Invention

[0032] Terms that are currently widely used are selected as terms used in example embodiments in consideration of functions in the present disclosure, but may be
20 changed depending on the intention of those skilled in the art or a judicial precedent, the emergence of a new technique, and the like. In addition, in specific cases, there may be terms arbitrarily chosen by the applicant. In this case, the meaning of such a term will be described in detail in a corresponding description portion. Therefore, the terms used in the present disclosure should be defined on the basis of the
25 meanings of the terms and the content throughout the present disclosure rather than the simple names of the terms.

[0033] Throughout the specification, unless otherwise specified, "including" any component means that other components may be further included rather than
30 excluding other components. In addition, the terms "-unit," "-module," and the like, described in the specification refer to a processing unit of at least one function or operation and may be implemented by hardware or software or a combination of hardware and software.

[0034] The expression "at least one of a, b, and c" described throughout the specification may include "a alone," "b alone," "c alone," "a and b," "a and c," "b and c," or "all of a, b, and c".

5 **[0035]** A terminal described below may refer to an electronic apparatus, which may be implemented as a computer or a portable terminal capable of accessing a server or another electronic apparatus through a network. Here, computers may include, for example, a notebook, a desktop, a laptop, and the like, which are equipped with a web browser, and portable terminals are wireless communication devices that ensure portability and mobility, and may include, for example, International Mobile
10 Telecommunications (IMT), code division multiple access (CDMA), W-code division multiple access (W-CDMA), or Long Term Evolution (LTE) terminals, and all kinds of handheld-based wireless communication devices, such as a smartphone and a tablet PC.

[0036] In the following description, example embodiments of the present disclosure will
15 be described in detail with reference to the drawings so that those skilled in the art can easily carry out the present disclosure. The present disclosure may be embodied in many different forms and is not limited to the embodiments described herein.

[0037] Hereinafter, example embodiments of the present disclosure will be described in detail with reference to the accompanying drawings.

20 **[0038]** In describing example embodiments, descriptions of technical contents that are well known in the technical field to which the present disclosure pertains and are not directly related to the present disclosure will be omitted. This is to more clearly convey the gist of the present disclosure without ambiguity by omitting unnecessary explanations.

25 **[0039]** For the same reason, some components in the accompanying drawings are exaggerated, omitted, or schematically illustrated. In addition, the size of each component does not entirely reflect the actual size. The same reference numerals are assigned to the same or corresponding components in each drawing.

30 **[0040]** Various advantages and features of the present disclosure and methods of accomplishing them will become apparent from embodiments to be described in detail below with reference to the accompanying drawings. However, the present disclosure is not limited to the embodiments to be described below, but may be

implemented in various different forms, these exemplary embodiments are provided only in order to make the present disclosure complete and allow those skilled in the art to completely recognize the scope of the present disclosure, and the present disclosure is defined by the scope of the claims. Throughout the specification, like reference numerals denote like elements.

[0041] In this case, it will be appreciated that each block of a processing flowchart and combinations of the flowcharts may be executed by computer program instructions. Since these computer program instructions may be mounted in a processor of a general computer, a special computer, or other programmable data processing apparatuses, these computer program instructions executed through the process of the computer or the other programmable data processing apparatuses create means performing functions described in the block(s) of the flowchart. Since these computer program instructions may also be stored in a computer usable or computer readable memory of a computer or other programmable data processing apparatuses in order to implement the functions in a specific scheme, the computer program instructions stored in the computer usable or computer readable memory can also produce manufacturing articles including instruction means performing the functions described in the block(s) of the flowchart. Since the computer program instructions may also be mounted in the computer or the other programmable data processing apparatuses, the instructions performing a series of operation steps on the computer or the other programmable data processing apparatuses to create processes executed by the computer, thereby executing the computer or the other programmable data processing apparatuses may also provide steps for performing the functions described in the block(s) of the flowchart.

[0042] In addition, each block may indicate some of modules, segments, or codes including one or more executable instructions for executing a specific logical function(s). Further, it is to be noted that functions described in the blocks occur in a different sequence in some alternative embodiments. For example, two blocks that are shown consecutively can actually be simultaneously performed or can be performed in a reverse sequence depending on corresponding functions.

[0043] FIG. 1 is a schematic configuration diagram illustrating a system for managing working information according to an example embodiment.

[0044] According to various example embodiments, an information providing system may include an electronic apparatus 110, at least one worker terminal 120, and a network 130 supporting transmission and reception of information therebetween.

5 **[0045]** According to an example embodiment, the electronic apparatus 110 may include a plurality of computer systems or computer software implemented as a network server, and may organize various types of information into a web page and provide the information. For example, the electronic apparatus 110 may be a computer system and computer software that are connected to a lower device capable of communicating with other network servers through a computer network such as an
10 intranet or the Internet to accept a working execution request, perform an operation thereon, and provide an execution result. In addition, the electronic apparatus 110 may be understood broadly to include a series of application programs that may operate on a network server and various databases built therein. For example, the electronic apparatus 110 may be implemented using network server programs that
15 are variously provided according to operating systems such as DOS, Windows, Linux, UNIX, or MacOS.

[0046] In order to manage working information, the electronic apparatus 110 receives first information related to execution of work from at least one worker terminal 120 of at least one worker, checks working progress status information of at least some
20 of the at least one worker based on first information, selects a target worker of the at least one worker based on the working progress status information, and transmits second information providing an alarm to the worker terminal 120 of the selected target worker. The network 130 may be used for communication between the electronic apparatus 110 and the worker terminal 120.

25 **[0047]** A method of managing working information by an electronic apparatus 110 will be described below in more detail with reference to FIGS. 2 to 7.

[0048] According to an example embodiment, the electronic apparatus 110 may display information related to a series of working information management methods to a manager. In this case, the electronic apparatus 110 may provide information related
30 to a series of working information management methods to a manager terminal (not shown), and the manager may check a working information management status using the manager terminal.

[0049] The electronic apparatus 110 may be implemented integrally with the manager terminal or may be implemented in a manner in which the manager terminal transmits and receives information with the electronic apparatus 110 through the network 130.

[0050] The network 130 may serve to connect between the electronic apparatus 110 and the worker terminal 120 or connect between the electronic apparatus 110 and an external device (for example, a distribution management server, a carrier server, and the like). For example, the network 130 may provide a connection path through which the worker terminal 120 or the external device is connected to the electronic apparatus 110 to transmit and receive packet data to and from the electronic apparatus 110.

[0051] Operations related to a series of working information management methods according to various example embodiments may be implemented by a single physical device, or may be implemented in a manner in which a plurality of physical devices are organically combined. For example, some of the components included in the system for managing working information may be implemented by any one physical device, and other components may be implemented by another physical device. For example, any one physical device may be implemented as a part of the electronic apparatus 110, and another physical device may be implemented as a part of the manager terminal, a part of an external device, or a part of the worker terminal 120. In some cases, the components included in the system for managing working information are distributed and arranged in different physical devices, and the distributed and arranged components may be organically combined and implemented to perform the function and operation of the system for managing working information. For example, some operations described herein as being performed by the electronic apparatus 110 may be performed by a first server, and some other operations may be performed by a second server.

[0052] FIG. 2 is an operation flowchart of a method of managing working information by an electronic apparatus according to an example embodiment.

[0053] Referring to FIG. 2, in operation 210, the electronic apparatus 110 receives first information related to the execution of work from at least one worker terminal 120 related to at least one worker. The first information may include information on an item identified by at least one worker terminal 120 and information on a location

where the identified item is arranged. In addition, the first information may include at least one of a time when the information on the item is identified and a time when the location where the information on the item is arranged is identified.

5 **[0054]** According to an example embodiment, the first information may be information generated by scanning a barcode of an item. In this case, the execution of the work may be counted by identifying the barcode of the item.

10 **[0055]** According to an example embodiment, work performed by at least one worker may include a stowing task of displaying items at a specific location. By displaying an item at a specific location, the items may be rapidly collected and packaged when an order for the items is received later. In this case, the first information may include information on items to be displayed and information on a location where the items are displayed.

15 **[0056]** According to an example embodiment, work performed by the at least one worker may include a picking task of collecting items displayed at a specific location and moving the collected items to a packing zone. By collecting the items and moving the collected items to the packing zone, the packaging at the packing zone may be performed quickly. In this case, the first information may include information on the collected items and information on the location where the items are collected.

20 **[0057]** According to an example embodiment, at least part of the information related to at least one worker may be received from an external device. For example, when a worker identifies an item by identifying the barcode of the item using a scanning device instead of the worker terminal 120, the information on the identified item may be transmitted from the barcode to the worker terminal 120, or transmitted to the electronic apparatus 110 without going through the worker terminal 120. In this case, the electronic apparatus 110 may check working progress status information further based on the information related to the at least one worker received from the external device.

25 **[0058]** In operation 220, the electronic apparatus 110 checks working progress status information of at least some of the at least one worker based on the first information. The working progress status information may include identification (ID) information of a specific worker, a number of items processed per unit time by the specific worker,

and time information corresponding to the acquisition of the first information.

5 **[0059]** The identification information of the worker is information for identifying the specific worker from other workers and may be determined in various ways. According to an example embodiment, the identification information of the worker may be determined in a form in which a name and a mobile phone number of the worker are combined. According to another example embodiment, a character string directly determined by the worker may be used as the identification information of the worker, and the corresponding character string may be determined not to overlap with those of other workers. In addition, the identification information of the worker may be determined in various ways without being restricted to a specific method.

15 **[0060]** The number of items processed per unit time may correspond to a value obtained by dividing the number of items that a specific worker has processed since beginning work by the number of hours the specific worker has worked since beginning work. The number of hours the specific worker has worked since beginning work may be calculated in various ways. For example, the number of hours the specific worker has worked since beginning work may be simply calculated as the time elapsed since beginning work, calculated by excluding a predetermined meal time from the time elapsed since beginning work, or by excluding a legal break time from the time elapsed since beginning work.

20 **[0061]** In the case of processing the bundled items, the number of processed items may be calculated as one or may be counted in the same way as is processing each of the individual bundled items. For example, when 12 bottles of water packed in a box are processed, the box may be calculated as processing 1 item or 12 items.

25 **[0062]** The time information corresponding to the acquisition of the first information may be related to the time when the worker last performed the work. According to an example embodiment, the time information corresponding to the acquisition of the first information may correspond to the time when the worker last performed the work. According to another example embodiment, the time information corresponding to the acquisition of the first information may correspond to the time that has elapsed since the worker last performed the work.

30 **[0063]** According to an example embodiment, the method of managing working

information by the electronic apparatus 110 may further include an operation of determining whether the number of items processed per unit time by a specific worker is lower than a threshold value. In an example embodiment, the threshold value may be a preset value or a value that changes adaptively according to the working status. That is, the electronic apparatus 110 may further determine whether the number of items processed per unit time by a specific worker is lower than a preset threshold value. In this case, the working progress status information may include information corresponding to a result of determining whether the number of items processed per unit time by a specific worker is lower than the preset threshold value. As an example, the working progress status information may further include a value indicating whether the number of items processed per unit time by a specific worker is lower than the preset threshold value. As another example, when the number of items processed per unit time is lower than the preset threshold value, the working progress status information may display information of a specific worker in a different color. As another example, in the working progress status information, information related to workers whose number of items processed per hour is lower than the preset threshold value and information related to workers whose number of items processed per hour is higher than the preset threshold value may be displayed separately.

20 **[0064]** The threshold value does not always have to be a fixed value but may be a value that is flexibly determined. According to an example embodiment, the threshold value may be set to a different value according to a type of work of a specific worker. For example, when the work performed by the specific worker corresponds to the stowing task of displaying items at a specific location, the threshold value may be set to a first value, and when the work performed by the specific worker corresponds to a picking task of collecting the items displayed at a specific location and moving the collected items to a packing zone, the threshold value may be set to a second value.

25 **[0065]** According to an example embodiment, the threshold value may be set to a different value depending on whether the work performed by the specific worker is performed on an individual item or a bundled item. For example, when the work performed on the bundled item is counted as processing one item, the threshold value when the work performed by the specific worker is performed on the individual item

may be set to be greater than the threshold value when the work performed by the specific worker is performed on the bundled item. On the other hand, when the execution of the work on the bundled item is counted in the same way as processing each of the individual bundled items (for example, when 12 bottles of water packed in a box are processed, the box is calculated as processing 12 items), the threshold value when the work performed by the specific worker is performed on the individual item may be set to be lower than the threshold value when the work performed by the specific worker is performed on the bundled item.

[0066] According to an example embodiment, the working progress status information may be displayed on the manager terminal. In this case, the manager may check the working information management status using the manager terminal. As described above, the electronic apparatus 110 and the manager terminal may be implemented integrally, and the electronic apparatus 110 and the manager terminal may be implemented as separate devices in a manner in which the electronic apparatus 110 and the manager terminal transmit and receive information through the network 130.

[0067] The display of the working progress status information on the manager terminal will be described below in more detail with reference to FIG. 3.

[0068] In operation 230, the electronic apparatus 110 selects a target worker from one or more workers based on the working progress status information. The target worker may correspond to a worker who is to be called or to whom feedback is to be provided among the at least one worker.

[0069] The electronic apparatus 110 may select a target worker based on the identification information of the specific worker, the number of items processed per unit time by the specific worker, and the time information corresponding to the acquisition of the first information that are included in the working progress status information. In addition, when the working progress status information includes information corresponding to a result of determining whether the number of items processed per unit time by the specific worker is lower than the preset threshold value, the electronic apparatus 110 may select the target worker further based on whether the number of items processed per unit time is lower than the preset threshold value.

[0070] According to an example embodiment, when the working progress status

information does not include the information corresponding to the result of determining whether the number of items processed per unit time by the specific worker is lower than the preset threshold value, the electronic apparatus 110 may directly calculate whether the number of items processed per unit time by the specific worker is lower than the preset threshold value. Furthermore, when the working progress status information does not include the number of items processed per unit time by the specific worker, the electronic apparatus 110 may directly calculate the number of items processed per unit time by the specific worker.

[0071] The electronic apparatus 110 may select a target worker according to various methods. As an example, the electronic apparatus 110 may select the worker as the target worker when the number of items processed per unit time by the specific worker is 500 or less, or when the time that has elapsed since the last work was performed exceeds 30 minutes. As another example, the electronic apparatus 110 may select the worker as the target worker when the number of items processed per unit time by the specific worker is 800 or less, or when the time that has elapsed since the last work was performed exceeds 20 minutes. In addition, the electronic apparatus 110 may select the target worker according to various methods, regardless of specific criteria.

[0072] According to an example embodiment, the electronic apparatus 110 may further receive third information related to a request for help from a worker. In this case, the electronic apparatus 110 may select the target worker by further considering the third information. For example, the electronic apparatus 110 may select the worker as the target worker when the number of items processed per unit time by a specific worker is 500 or less, or when the time that has elapsed since the last work was performed exceeds 30 minutes. However, even when at least one of the two conditions is satisfied, when the number of requests for help from the worker exceeds three, the electronic apparatus 110 determines that feedback has already been provided, and may not select the corresponding worker as the target worker.

[0073] A request for help from a worker according to an example embodiment may include a request for help in the stowing task of displaying items at a specific location and a request for assistance in the picking task of collecting items displayed at a specific location and moving the collected items to a packing zone. In particular, in

the case of a request for help in the picking task of collecting items displayed at a specific location and moving the collected items to a packing zone, the displayed items may be located high or at a corner location out of the reach of a worker, and thus the displayed items may include a problem solving request for which a request for help is physically inevitable.

[0074] The third information related to the request for help from the worker may be information that reflects the total number of requests for help from the worker in real time, but each of the individual requests for help from the worker may correspond to the third information. When each of the individual requests for help of the worker corresponds to the third information, whenever the electronic apparatus 110 receives the third information, the electronic apparatus 110 may input and store the received third information in the memory to calculate the number of requests for help from the worker.

[0075] The third information related to the request for help from the worker may be information included in the working progress status information or may be separate information therefrom. The third information related to the request for help from the worker is generally received from the worker terminal 120, but is not necessarily limited thereto, and may be received from an external device or may be received in various other ways.

[0076] According to an example embodiment, the electronic apparatus 110 may select the target worker by further considering the worker's skill level. For example, the electronic apparatus 110 may select the worker as the target worker when the number of items processed per unit time by the specific worker is 500 or less, or when the time that has elapsed since the last work was performed exceeds 30 minutes. However, even when at least one of the two conditions is satisfied, when the worker's skill level is not sufficient (hereinafter, new worker), it is determined that it is necessary to give workers more time to master working and the corresponding worker may not be selected as the target worker.

[0077] The worker's skill level may be information determined in consideration of at least some of conditions such as how many times the worker has performed a corresponding type of work, how often the worker has performed the corresponding type of work, and when the worker most recently performed the corresponding type

of work. For example, when a worker performs the type of work for the first time, a worker has performed the type of work a total of 10 times or more but a ratio of working days when the worker performed the type of work to a total of working days is less than 10%, or more than two weeks have passed since the last working day when the most recent type of work was performed, excluding the days when the skill level is determined, it is determined that the worker's skill level is insufficient, and the corresponding worker may be classified as a new worker.

[0078] The worker's skill level may be determined by the worker terminal 120, may be determined by an external device, or may be determined by the electronic apparatus 110. When the worker's skill level is determined by the electronic apparatus 110, the electronic apparatus 110 may receive at least some of the conditions such as how many times the worker has performed the type of work, how often the worker has performed the type of work, and when the worker most recently performed the corresponding type of work, and determine the worker's skill level based on at least some of the received conditions.

[0079] The worker's skill level may be information included in the working progress status information or may be separate information therefrom. The worker's skill level is generally received from the worker terminal 120, but is not necessarily limited thereto, and may be received from an external device or may be received in various other ways, and may be information determined by the electronic apparatus 110 as described above.

[0080] In operation 240, the electronic apparatus 110 transmits second information providing an alarm to the worker terminal 120 of the selected target worker. The second information may provide various types of alarms so that a worker may recognize the alarms and may include, for example, a case of outputting a message to the worker terminal 120, outputting an alarm sound to the worker terminal 120, or vibrating a worker terminal 120.

[0081] The worker terminal 120 receiving the second information may be locked according to the second information. In order to unlock the worker terminal 120, a specific operation may have to be performed, and the specific operation may be an operation performed after a worker receives feedback on his or her working progress status. For example, the worker terminal 120 may be unlocked by bringing the

worker terminal 120 in contact with the electronic apparatus 110, bringing the worker terminal 120 in contact with the manager terminal, or inputting a password.

5 [0082] The electronic apparatus 110 according to various example embodiments of the present disclosure may check the working progress status information of at least one worker, select the target worker in response to the checked working process status information, and provide an alarm to the worker terminal 120 of the selected target worker, so the company may effectively supervise and manage the working status of workers and quickly and easily provide feedback to workers with low working efficiency. In addition, according to the present disclosure, it is possible to
10 determine whether to call the worker and provide the feedback to the worker in further consideration of various factors as well as the working efficiency by allowing the target worker to be flexibly selected according to various criteria.

[0083] Hereinafter, in FIGS. 3 to 6, information such as working progress status information according to the example embodiment may be displayed on the manager
15 terminal. In this case, the manager may check the working information management status using the manager terminal. The working progress status information is not necessarily displayed on the manager terminal, and the embodiment in which the target worker is selected according to the working progress status information without a separate manager may also be implemented. However,
20 for convenience of description, FIGS. 3 to 6 illustrate an example embodiment in which the information such as the working progress status information is displayed on the manager terminal (as indicated by reference numeral 300 or the like). However, the description of FIGS. 3 to 6 is not limited to the embodiment in which the information such as the working progress status information is displayed on the
25 manager terminal, and FIGS. 3 to 6 should be considered to illustratively describe the information such as the working progress status information regardless of whether the working progress status information is displayed on the manager terminal.

[0084] FIG. 3 is a diagram for illustratively describing the working progress status
30 information according to the example embodiment.

[0085] According to an example embodiment, the working progress status information may include information on whether work performed by a specific worker is

performed on an individual item or a bundled item as indicated by a dashed-line box 310. The working progress status information according to the example embodiment may identify whether items are bundled in "each" or "pallet". In this case, the individual item or the work performed on the individual item may correspond to the "each" or the bundled item or the work performed on the bundled item may correspond to the "pallet".

[0086] According to an example embodiment, the working progress status information may include identification information of a specific worker as indicated by a dashed-line box 320. The working progress status information according to the example embodiment may determine the identification information of the specific worker by combining a worker's name and an 8-digit serial number. Different persons with the same name may be identified by the 8-digit serial number. However, for clearer identification, in some embodiments, when different persons with the same name exist, at least some of the persons with the same name may be easily identified from each other by adding a letter after the name. For example, identification information such as ○○B Yoon (49835848) may be given to worker "○○ Yoon" with whom another worker shares the same name.

[0087] According to an example embodiment, the 8-digit serial number may correspond to the last 8 digits of a mobile phone number.

[0088] According to an example embodiment, the working progress status information may include third information related to a request for help from a worker as indicated by a dashed-line box 330. According to an example embodiment, the working progress status information may help a manager in determining whether to select a specific worker as a target worker by displaying whether the worker is currently requesting help (corresponding to "Help" in the drawing) and how many times the worker has requested help (corresponding to "Help Count" in the drawing) since beginning work on that day together. For example, for workers ○○ Park (2776285), ○○B Yoon (49835848), and ○○ Lee (68730796) who are currently requesting help at 330, a Help notification may be displayed in real time.

[0089] The third information related to the request for help from the worker may be information included in the working progress status information or may be separate information therefrom. However, even when the third information is the separate

information from the working progress status information, the electronic apparatus 110 and the manager may further consider the third information to select the target worker, and the third information may be displayed on the manager terminal.

[0090] According to an example embodiment, the working progress status information may include the number of items processed per unit time by a specific worker as indicated by a dashed-line box 340. According to an example embodiment, the working progress status information may help a manager in determining whether to select a specific worker as a target worker by displaying the number of items (corresponding to the "unit" of "Unit/Hour" in the drawing) that the specific worker has processed since work and the number of hours (corresponding to the "hour" of "Unit/Hour") the specific worker has worked since beginning work along with the number of items (corresponding to "UPH" in the drawing) processed per unit time by the specific worker.

[0091] In addition, according to an example embodiment, when the number of items processed per unit time by the specific worker is lower than a preset threshold value, a separate notification may be output or the number of items processed per unit time may be displayed in a different font, a different color, a different font size, with shading, or the like to highlight the corresponding content. For example, for workers ○○B Yoon (49835848) and ○○ Lee (68730796), since the number of items processed per unit time is less than the criterion, the number of items processed per unit time may be highlighted with shading.

[0092] According to an example embodiment, the working progress status information may include time information corresponding to the acquisition of the first information related to the execution of the work as indicated by a dashed-line box 350. According to an example embodiment, the working progress status information may help a manager in determining whether to select a specific worker as a target worker by displaying the time (corresponding to the "last scan time" in the drawing) when the worker last performed working and the time (corresponding to "idle time" in the drawing) that has elapsed since the worker last performed working together.

[0093] In addition, according to an example embodiment, when the time that has elapsed since the worker last performed working exceeds a preset threshold value, a separate

notification may be output or the number of items processed per unit time may be displayed in a different font, a different color, a different font size, with shading, or the like to highlight the corresponding content. For example, in the case of workers ○○ Park (2776285), ○○B Yoon (49835848), and ○○ Lee (68730796), the time that has elapsed since the last work was performed exceeds a preset threshold value, and thus the time that has elapsed since the last work was performed may be highlighted with shading.

[0094] FIG. 4 is a diagram for illustratively describing a criterion for selecting a target worker by an electronic apparatus according to an example embodiment.

[0095] Referring to FIG. 4, the electronic apparatus 110 according to the example embodiment may select the target worker based on the identification information of the specific worker, the number of items processed per unit time by the specific worker, and the time information corresponding to the acquisition of the first information that are included in the working progress status information. Specifically, the electronic apparatus 110 may select the target worker based on whether the number of items processed per unit time by the specific worker is lower than the threshold value and whether time information corresponding to the acquisition of the first information exceeds the threshold value.

[0096] The threshold value to be compared with the number of items processed per unit time by the specific worker may correspond to "Low UPH 420" in the drawing, and the threshold value to be compared with the time information corresponding to the acquisition of the first information may correspond to "Idle Time 430" in the drawing. Hereinafter, for convenience of description, the threshold value to be compared with the number of items processed per unit time by the specific worker is referred to as the Low UPH 420, and the threshold value to be compared with the time information corresponding to the acquisition of the first information is referred to as the Idle Time 430.

[0097] According to an example embodiment, the Low UPH 420 and the Idle Time 430 may be set to different values depending on whether the work performed by the specific worker is performed on an individual item or a bundled item. For example, when the work performed by the specific worker is performed on the individual item, the Low UPH 420 may be set to 195 and the Idle Time 430 may be set to 10. On

the other hand, when the work performed by the specific worker is performed on the bundled item, the Low UPH 420 may be set to 870, and the Idle Time 430 may be set to 10 (in the foregoing example, the embodiment in which the Idle Time 430 is set to be the same is disclosed, but like the Low UPH 420, the Idle Time 430 may also be set to a different value depending on whether the work performed by the specific worker is performed on the individual item or the bundled item).

[0098] Although not shown in the drawing, the Low UPH 420 and the Idle Time 430 may be set to different values depending on the type of work (for example, whether the work performed by the specific worker corresponds to the stowing task of displaying the items at a specific location or corresponds to the picking task of collecting the items displayed at the specific location and moving the collected items to the packing zone) performed by the specific worker.

[0099] The electronic apparatus 110 according to the example embodiment may further consider a target workload of the specific worker. The target workload represents the desired number of items to be processed per unit time by a worker and may correspond to "Target UPH 410" in the drawing. Hereinafter, for convenience of description, the target workload is referred to as Target UPH 410.

[00100] According to an example embodiment, the Target UPH 410 may affect the selection of the target worker. For example, even when the number of items processed per unit time by the specific worker is lower than the Low UPH 420, when the number of items processed per unit time in a working day prior to that day exceeds the Target UPH 410, the specific worker may not be selected as the target worker. Alternatively, according to an example embodiment, the Target UPH 410 does not directly affect the selection of the target worker but may be used as reference material for the working efficiency of the specific worker.

[00101] According to an example embodiment, similar to the Low UPH 420 or the Idle Time 430, the Target UPH 410 may be set to different values depending on whether the work performed by the specific worker is performed on an individual item or a bundled item. For example, when the work performed by the specific worker is performed on the individual item, the Target UPH 410 is set to 300, and when the work performed by the specific worker is performed on the bundled item, the Target UPH 410 may be set to 1350.

[00102] Although not shown in the drawing, the Target UPH 410 may be set to a different value depending on the type of work performed by the specific worker.

[00103] FIG. 5 is a diagram for illustratively describing a process of transmitting second information from the electronic apparatus to a worker terminal according to an example embodiment.

[00104] Referring to FIG. 5, the electronic apparatus 110 transmits the second information providing the alarm 500 to the worker terminal 120 of the selected target worker. In this case, the electronic apparatus 110 may display identification information 510 of the selected target worker and whether the transmission of the second information is successful 520 on the manager terminal. In addition, when it is necessary to input a password to unlock the worker terminal 120, the electronic apparatus 110 may further display the password 530 for unlocking the worker terminal 120 on the manager terminal.

[00105] According to an example embodiment, whether the transmission of the second information is successful 520 may be displayed based on whether an acknowledgment signal (ACK) transmitted from the worker terminal 120 is received. Specifically, the worker terminal 120 successfully receiving the second information transmits the acknowledgment signal to the electronic apparatus 110, and the electronic apparatus 110 receiving the acknowledgment signal may acknowledge that the worker terminal 120 has successfully received the second information and may display that the transmission of the second information has succeeded. On the other hand, when the acknowledgment signal is not received for a preset time, the electronic apparatus 110 may determine that the worker terminal 120 has not successfully received the second information and may display that the transmission of the second information has failed. In this case, the electronic apparatus 110 may attempt to retransmit the second information according to the instruction of the worker and may automatically attempt to retransmit the second information without a separate instruction of a worker.

[00106] According to an example embodiment, a password 530 for unlocking the worker terminal 120 may be set differently for each worker or may be set to be the same for at least some workers. When the password 530 is set to be the same for at least some of the workers, the password 530 may be changed every predetermined period

in order to maintain the security of the password 530. When the password 530 is changed, the changed password 530 may be displayed on the manager terminal.

[00107] FIG. 6 is a diagram for illustratively describing a case of selecting a target worker in consideration of a worker's skill level according to an example embodiment.

5 **[00108]** Referring to FIG. 6, the electronic apparatus 110 may select a target worker in further consideration of a worker's skill level, and the worker's skill level may be displayed on the manager terminal. According to an example embodiment, the worker's skill level may be displayed on the right side of the identification information of the worker, and for experienced workers, separate display may be
10 omitted, and for inexperienced workers, a "new" button may be displayed 610.

[00109] The electronic apparatus 110 may determine that it is necessary to provide additional working mastery time to a new worker and may not select the corresponding worker as the target worker.

15 **[00110]** FIG. 7 is a diagram for illustratively describing a terminal receiving second information according to an example embodiment.

[00111] Referring to FIG. 7, the electronic apparatus 110 may transmit the second information providing the alarm to the worker terminal 120 of the selected target worker. The second information may include various types of information such as output of a message, output of a notification sound, and generation of vibration. For
20 example, the second information may output a message 710 indicating "Please visit a manager".

[00112] The worker terminal 120 receiving the second information may be locked according to the second information. The worker terminal 120 may display a lock screen so that a worker may recognize the screen. In addition, when the worker
25 terminal 120 is unlocked by inputting a password, the worker terminal 120 may output a message to input a password for unlocking. For example, the worker terminal 120 may output a message 720 indicating "Unlock: OOOO".

[00113] FIG. 8 is a diagram of a configuration of an electronic apparatus for managing working information according to an example embodiment.

30 **[00114]** Referring to FIG. 8, the electronic apparatus 110 includes a transceiver 810, a processor 820, and a memory 830. The electronic apparatus 110 is connected to a worker terminal 120, a manager terminal, an external device (for example, a personal

computer), and the like through the transceiver 810, and may exchange data.

[00115] The processor 820 may include at least one of the devices described above with reference to FIGS. 1 to 7 or may perform at least one of the methods described above with reference to FIGS. 1 to 7. The memory 830 may store information (including first information, second information, and third information described above) for performing at least one method described above with reference to FIGS. 1 to 7. The memory 830 may be a volatile memory or a nonvolatile memory.

[00116] The processor 820 may execute a program and control the electronic apparatus 110 for managing working information. A code of the program executed by the processor 820 may be stored in the memory 830.

[00117] In addition, the electronic apparatus 110 according to the example embodiment may further include an interface that may receive information from a manager and provide the information to the manager.

[00118] The present specification and drawings have been described with respect to the example embodiments of the present disclosure. Although specific terms are used, it is only used in a general sense to easily explain the technical content of the present disclosure and to help the understanding of the invention, and is not intended to limit the scope of the specification. It will be apparent to those skilled in the art that other modifications based on the technical spirit of the present disclosure may be implemented in addition to the embodiments disclosed herein.

[00119] The electronic apparatus or terminal according to the above-described embodiments may include a processor, a memory that stores and executes program data, a permanent storage such as a disk drive, a communication port that communicates with an external device, a touch panel, a key, a user interface device such as a button, and the like. Methods implemented as software modules or algorithms may be stored on a computer-readable recording medium as computer-readable codes or program instructions executable on the processor. Here, examples of the computer-readable recording medium may include magnetic storage media (for example, a read-only memory (ROM), a random-access memory (RAM), a floppy disk, a hard disk, etc.), optical reading media (for example, a compact disc (CD)-ROM or a digital versatile disc (DVD)), and the like. The computer-readable recording medium may be distributed in computer systems connected to each other

through a network, and as a result, the computer-readable codes may be stored in a distributed scheme and executed. The medium may be readable by a computer, stored in a memory, and executed on a processor.

[00120] The present embodiments may be represented by functional block configurations and various processing steps. These functional blocks may be implemented by various numbers of hardware and/or software components that execute specific functions. For example, the embodiment may employ integrated circuit configurations, such as a memory, processing, logic, and a look-up table, capable of executing various functions by control of one or more microprocessors or other control devices. Similar to executing the components in software programming or software elements, the present embodiment can be implemented in programming or scripting languages such as python, C, C++, Java, and assembler, including various algorithms implemented by a combination of data structures, processes, routines or other programming configurations. Functional aspects may be implemented in algorithms executed on one or more processors. In addition, the present embodiments may employ a conventional technology for electronic environment setting, signal processing, and/or data processing, and the like. Terms such as "mechanism," "element," "means," and "configuration" may be used broadly, and are not limited to mechanical and physical configurations. The terms may include the meaning of a series of routines of software in connection with a processor or the like.

[00121] The above-described embodiments are merely examples, and other embodiments may be implemented within the scope of the following claims.

CLAIMS

1. A method of managing working information in an electronic apparatus, the method comprising:
 - receiving first information related to execution of work from one or more
 - 5 terminals related to one or more workers;
 - checking working progress status information of at least some of the one or more workers based on the first information;
 - selecting a target worker from the one or more workers based on the working progress status information; and
 - 10 transmitting second information providing an alarm to a terminal of the selected target worker.
2. The method of claim 1, wherein the terminal of the target worker is locked according to the second information.
- 15 3. The method of claim 1, wherein the first information includes at least one of information on an item identified by the one or more terminals, information on a location where the identified item is arranged, a time when the information on the item is identified, and a time when the location where the item is arranged is identified.
- 20 4. The method of claim 1, wherein the working progress status information includes identification information of a specific worker, a number of items processed per unit time by the specific worker, and time information corresponding to an acquisition of the first information.
- 25 5. The method of claim 1, wherein the work includes displaying the item at a specific location, and
 - the first information includes information on the displayed item and information on a location where the item is displayed.
- 30 6. The method of claim 1, wherein the work includes collecting an item displayed at a specific location and moving the collected item to a packing zone, and

the first information includes information on the collected item and information on a location where the item is collected.

7. The method of claim 1, further comprising:
 - 5 determining whether a number of items processed per unit time by a specific worker is lower than a threshold value,
wherein the working progress status information includes information corresponding to a result of the determining.
- 10 8. The method of claim 7, wherein the threshold value is set to a different value according to a type of work of the specific worker.
9. The method of claim 7, wherein the threshold value is set to a different value depending on whether the work is performed on an individual item or is performed on a
15 bundled item.
10. The method of claim 1, further comprising:
 - receiving third information related to a request for help from the target worker,
wherein the third information is further taken into consideration to select the
20 target worker.
11. The method of claim 1, wherein a skill level of a specific worker related to the work is taken into consideration to select the target worker.
- 25 12. The method of claim 1, wherein the first information is generated based on checking at least one of identification information of an item and identification information of a location by the one or more terminals.
13. The method of claim 1, wherein a message is output to the terminal, an alarm
30 sound is output to the terminal, or a vibration is output to the terminal based on the second information.

14. A computer-readable non-transitory recording medium on which a program allowing a computer to execute the method of claim 1 is recorded.
15. An electronic apparatus for managing working information, comprising:
- 5 a transceiver;
a memory comprising instructions; and
a processor,
wherein the processor is connected to the memory to receive first information related to execution of work from one or more terminals related to one or more workers,
10 check working progress status information of at least some of the one or more workers based on the first information, select a target worker from the one or more workers based on the working progress status information, and transmit second information providing an alarm to a terminal of the selected target worker.