Sheffield, UK

TRANSLATION EDITOR AFFIDAVIT

I, Aidan English, a translator fluent in the Japanese and English languages, on behalf of Geotext Translations, do solemnly and sincerely declare that the attached translation is, to the best of my knowledge and belief, a true and accurate translation of Published Patent Application No. 1993-128022, dated May 25, 1993. To the best of my knowledge and belief, the attached translation is in a form that best reflects the intention and meaning of the original text. I have been warned that willful false statements and the like are punishable by fine or imprisonment, or both.

Signature 

Name
Aidan English

Dated
October 09, 2018

(19) **Japanese Patent Office (JP)**

(12) **Published Unexamined Patent Application (A)**

(11) Published Patent Application No.
1993-128022

(43) Publication Date **1993.5.25**

(51) Int. C1. [5]	Identifying symbol	Agency serial no.	FI	Technical display place
G06F 13/00	**351 L**	**7368-5B**		
H04B 7/26	**K**	**6942-5K**		

Examination Request: Not yet made Number of Claims: 1 (Total 7 pages)

(21) Application No.: 1991-310167

(22) Application Date: 1991.10.30

(71) Applicant: 000002185
Sony Corporation
6-7-35, Kitashinagawa, Shinagawa-ku, Tokyo

(72) Inventor: Takehiro Sugita
Sony Corporation
6-7-35, Kitashinagawa, Shinagawa-ku, Tokyo

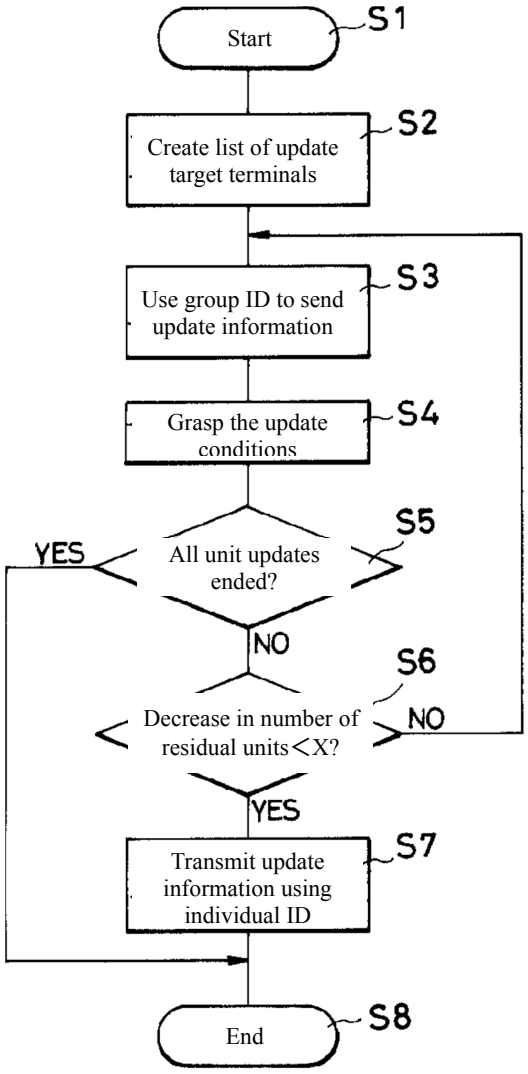
(74) Agent Attorney Akira Koike (two others)

(54) [Name of Invention] Mobile Communications Terminal Update Method

(57) [Summary]

[Configuration] To combine group ID showing group units among multiple mobile communication terminals, and individual IDs for each terminal, and transfer update information using the group ID in the initial stage of the update (Step S3), then at the stage when the reduction in the number of non-updated mobile communication terminals decreases (Step S7), update each mobile communication terminal one at a time, using its individual ID.

[Effect] Can efficiently (with just a few packets) update each terminal, and perform updates using a wireless circuit with small circuit capacity.



[Claims]
[Claim 1] A mobile communications terminal update method characterized by the performance of a software update within each mobile terminal of multiple mobile communications terminals using a wireless circuit, and by a mobile communications terminal update method whereby the above-mentioned multiple mobile communications terminals are updated in group units in the initial stage of the above-mentioned updates, and the above-mentioned multiple mobile communications terminals are individually updated in the final stage of the above-mentioned updates.
[Detailed Explanation of Invention]
[0001]
[Field of Industrial Application] This Invention is in relation to a mobile communications terminal update method for updating software within each mobile terminal of multiple mobile communications terminals that use a wireless circuit.
[0002]
[Prior Art] Previously, in mobile communications systems performing communication using wireless circuits, with mobile communications terminals mounted on mobile units such as ships, aircraft, and automobiles, etc., software update has been performed by replacement of the ROM within the said mobile communications terminal, or by similar means.
[0003]
[Issues To Be Resolved by the Invention] However, for example, there are cases where performing updates of software in mobile communications terminals mounted on the above-mentioned mobile units can be difficult.
[0004] In other words, here we can consider a case in which the above-mentioned mobile communications terminals are installed in 1000 cargo carrying vehicles (namely trucks) of a certain shipping company. Since this shipping company normally needs to effectively use as many of the trucks as possible, in practice the trucks cannot be all concentrated at a specific site.
[0005] When a software update is performed on a mobile communications terminal mounted on such trucks or other mobile units, for example, by replacement of the ROM or by a similar means, since in many cases the operator (driver) cannot perform the update, normally the update operation had to be performed, for example, by an engineer etc., who would visit each mobile communications terminals (in other words, each mobile unit truck).
[0006] However, when the above-mentioned shipping company has installed a terminal in each truck, there may be cases as described above where each truck cannot be returned to the site and operations are continued, due to the need for effective utilization of trucks, and in such cases it is easy to imagine that the above-mentioned engineer, etc., may have difficulty accessing the terminal.
[0007] As a result, realization of an update of software in a mobile communications terminal loaded onto the above-mentioned truck by, for example, replacement of the ROM, cannot be said to be an effective means when personnel expenses, etc., are taken into consideration.
[0008] For this reason, a method for performing updates of the mobile communications terminal software using the wireless circuit to the base station can be considered.
[0009] Unfortunately, the current mobile communications terminal software has in many cases become very large in size. Additionally, wireless circuits are limited in communication capacity, and in terms of communication traffic, it would be unavoidable that updating software have an effect on the normal communication service, particularly when using wireless circuits with small capacity.
[0010] In other words, even in cases where updates are attempted using a base station and wireless circuit as described above, since transmission of vast amounts of data to each mobile communications terminal is required, this would surely be difficult using data communications systems of small circuit capacity.
[0011] At this point, this Invention is proposed in view of the above-mentioned situations, and the objective is to provide a mobile communications terminal update method that enables reliable updates of software within the mobile communications terminal without the need for ROM replacement, etc., and with a small transmission volume.
[0012]
[Means for Resolving the Issues] The update method in this Invention is proposed for attainment of the above-mentioned objectives, and is a mobile communications terminal update method for performing updates of software within each mobile terminal of multiple mobile communications terminals that perform communication using wireless circuits, and in the initial stage of the above-mentioned update, update of the above-mentioned mobile communications terminals is performed in group units, while in the final stage of the above-mentioned update, update of the above-mentioned multiple mobile communications terminals is performed individually.
[0013] In other words, in this Invention, updates of mobile communications terminal software in wireless data communication systems are performed by remote manipulation by way of a base station. At this time, the software in the mobile communications terminal (unit) is designed to operate on a non-volatile RAM so that it can be updated using a wireless circuit from a base station. Additionally, the base station side (sending side) transmits the update information (all or part of the software) to each mobile communications terminal, with transmission at first performed based on the group ID of the group unit (all units, or the unit addresses belonging to a specific group), then the number of terminals in the group unit that complete the update in one round of transmission is investigated, and if the remaining number of units has decreased, the individual ID is used to perform updates of each unit one at a time. With this action, highly efficient updates can be performed.
[0014] In other words, the mobile communications terminal update method in this Invention is in relation to a method for efficiently updating software in mobile communications terminals using wireless circuits, and can achieve updates of multiple mobile communications terminals using a small number of transmission packets by, in the initial stage of the

update, using a group ID that applies to the group of multiple mobile communications terminals to transmit update information to each mobile communications terminal within said group, while in the final stage of the update, in other words, the stage in which the number of mobile communications terminals within the above-mentioned group that have not been updated has decreased, by transmitting update information to each mobile communications terminal using an individual ID that applies to each mobile communications terminal. The method in this Invention is particularly effective in data communication systems with small communication capacities.

[0015]

[Utilization] According to the update method in this Invention, in the initial stage of updating, multiple communication terminals are updated in group units, and in the final stage of updating, when the number of mobile communications terminals that have not been updated has decreased, the multiple communication terminals are updated individually.

[0016]

[Embodiment] Here follows an explanation of an Embodiment of this invention with referencing to illustrations.

[0017] The update method in this Embodiment is a mobile communications terminal update method whereby an update is performed on each mobile communications terminal m1, m2, m3, m4, ... of multiple mobile communications terminals that perform communication using wireless circuits (for example, in Fig.2, the mobile communications terminals m1, m2, m3, m4, ... mounted in automobiles or other mobile units M1, M2, M3, M4, …), such that, as shown in the flow chart in Fig.1, in the above-mentioned initial stage of the update, the above-mentioned mobile communications terminals m1, m2, m3, m4, ... are updated in a group unit (Step S3), and in the above-mentioned final stage of the update, the above-mentioned mobile communications terminals m1, m2, m3, m4, ... are updated individually (Step S7).

[0018] First, before the explanation in the Fig.1 flow chart, we will discuss the communication system applied in the Embodiment of this Invention. This communication system is configured, for example, as shown in Fig.2.

[0019] In this Fig.2, the communication system in this Embodiment comprises one or more communication base stations BS, and multiple mobile communication terminals m1, m2, m3, m4, … . Note that the above-mentioned base station BS may also be connected by a wired cable circuit to a user center US. In addition, the above-mentioned mobile communications terminals m1, m2, m3, m4, ... are data communications terminals whose utilization can be for vehicle mounting in automobiles, etc., or for remote unmanned system telemetry, etc.

[0020] In this Embodiment, updates of software for said mobile communications terminals m1, m2, m3, m4, ... are performed by using the wireless circuit with base station BS.

[0021] Fig.3 is an overview configuration diagram of the mobile communications terminals m1, m2, m3, m4, ... in this Embodiment.

[0022] In this Fig.3, transceiver 13 is a device which demodulates the wireless signal sent from the above-mentioned base station BS and received by antenna 16, outputs said signal to modem 12, such that said signal is encoded by said modem 12, and output as a wireless signal by means of antenna 16.

[0023] The above-mentioned modem 12 is a device which decodes the signal demodulated by the above-mentioned transceiver 13, and sends it to processor 11, such that encoded data is sent from processor 11, and output to the transceiver 13.

[0024] The above-mentioned processor 11 processes data decoded by the above-mentioned modem 12, and when necessary outputs the data via terminal 10 for external interfacing, or transfers data input from the external interface by way of said terminal 10, or data generated by the terminal itself, to the above-mentioned modem 12.

[0025] Furthermore, the above-mentioned processor 11 software operates on RAM 15 to enable updating by remote operation using a wireless circuit. In addition, if software is stored in ROM 14 within the above-mentioned mobile communications terminal, the content of the said ROM 14 must be temporarily transferred to the above-mentioned RAM 15. In such a case, the software within the above-mentioned RAM 15 must be checked to determine whether it has been corrupted or not, and judgment made whether to transfer or not. In other words, this kind of check and judgment is performed to prevent overwrite of the updated software in the above-mentioned wireless circuit.

[0026] Here, in the case of data communication in this Embodiment, the one-to-one communication format using individual IDs for individually updating the above-mentioned multiple mobile communication terminals m1, m2, m3, m4, ... , and the one-to-many communication format using group IDs for updating the above-mentioned multiple mobile communication terminals m1, m2, m3, m4, ... in group units, are in existence.

[0027] The relationship between the number of transmission packets of the software of the above-mentioned mobile communications terminals m1, m2, m3, m4, ... when using the above-mentioned individual IDs and group IDs in cases such as these, and the number of units not completing the update, is shown in Fig.4 and Fig.5.

[0028] In Fig.4 and Fig.5, when using the above-mentioned individual ID, a response (henceforth, called Ack; Acknowledgement) showing that each mobile communications terminal has received each of the above-mentioned packets sent from one specific machine to another is received so that update information can be transmitted reliably. As a result, as shown in Fig.4, the number of units awaiting update decreases linearly with the number of transmission packets.

[0029] On the other hand, when the above-mentioned group ID is used, since the update information for the multiple mobile communications terminals belonging to the group is

sent simultaneously without specifying the other party, transmission of one round of update information enables updating multiple terminals. However, in the case of this group ID, since receiving responses packets one at a time is normally not possible, there is no guarantee that packets will arrive at each mobile communications terminal reliably.

[0030] For this reason, when the above-mentioned group ID is used, information showing notification of the update end must be sent at that time to the base station BS, separately from the above-mentioned Ack response. In this case, since sending the update information only once would not end the updates for all terminals, the would have to be sent repeatedly, but as shown in Fig.5, the number of units with updates not completed versus the number of transmitted packets tends to decrease exponentially.

[0031] As described above, when the group ID is used, at first the decrease in the number of non-updated units is rapid, but as the remaining mobile communication terminals decrease in number, the volume of decrease in the number of the said non-updated units tails off, reducing efficiency.

[0032] Because of these issues, the Embodiment of this Invention uses a combination of the above-mentioned individual ID and group ID, taking advantage of their respective characteristics to achieve highly efficient updates.

[0033] In other words, the update in this Embodiment performs as shown by the algorithm of the base station BS in Fig.1, with a combination of the above-mentioned individual ID and group ID, taking advantage of their respective characteristics to achieve highly efficient updates. Note that, in the explanation in Fig.1, an example for the case of an update performed by the above-mentioned base station BS for each mobile communications terminal m1, m2, m3, m4, ... is given, but for example the user center US may also perform this in place of said base station BS.

[0034] In Fig.1, first, if starting the update process in Step S1, each of the mobile communications terminals m1, m2, m3, m4, ... targeted for update in Step S2 are listed up.

[0035] Next, in Step S3, the update information is sent with the above-mentioned group ID. Here, this update information may be either all or some of the above-mentioned mobile communications terminal software. Note that, the above-mentioned packet information is divided into multiple packets, but in this Embodiment, sending one round of update information means sending one series of multiple packets.

[0036] Furthermore, after the above-mentioned Step S3, In step 4, the update situation is ascertained. Here, the mobile communications terminals that were able to receive all the data without any errors have completed the update, and the information is sent to the base station BS. The base station BS receiving it counts the number of mobile communications terminals that have completed the update with this transmission, and deletes from the update target list those mobile communications terminals that have completed this update.

[0037] After that, in Step S5, the mobile communications terminals are checked to see if any remain on the target list, and if there are no non-updated mobile communications terminals (Yes), Step S8 is proceeded to and the update operation is ended.

[0038] In addition, if in Step S5 there are any non-updated mobile communication terminals remaining (No), Step S6 is proceeded to, where the decrease in the number not updated with this transmission is investigated, and if this number is larger than a certain value X (No), Step S3 is returned to in order use the group ID to transfer the update information again.

[0039] In Step S6, if the decrease in the above-mentioned number not updated is smaller than the above-mentioned value X (Yes), Step S7 is proceeded to, and in this Step S7 individual IDs are used to and send update information to the remaining terminals, then Step S8 is proceed to to end the process.

[0040] Note that 1 (small value) is normally used for the value X in Step S6 .

[0041] Here, in transmissions using the individual ID as described above, since an Ack response can be received for each packet one at a time (received by the base station BS), there is no requirement to receive and confirm information notification of update completion as was seen in the above-mentioned group ID case (however, receiving for confirmation is also acceptable).

[0042] In addition, depending on the mobile communications terminal, for example, there may be units placed inside a building, or behind an obstacle, where update information cannot be sent. In such a case, items with no Ack response even if a packet is sent the prescribed number of times are judged to be in a state where update information above cannot be sent as described above, so transmission is canceled, processing is stopped while some items remain on the update target list, and the update results are reported.

[0043] Fig.6 shows the activity flow on the part of each of the above-mentioned mobile communications terminals, and shows the action of each mobile communications terminal when an update packet (one packet out of the group of packets that make up the update information).

[0044] In this Fig.6, when each mobile communication terminal receives update information in Step S11, then in Step S12 said received update information is delivered to the temporary update storage area in the above-mentioned RAM 15 of said mobile communications terminal.

[0045] Next, in Step S13, it is investigated whether the update information has been completed or not. In other words, since the update information can be divided into multiple packets and sent, the update is considered complete if the series of packets has all been received without error. If in this Step S13 it is not completed (No), no further processing is performed, and Step S18 is proceed to to end the process.

[0046] In addition, if the update is completed in Step S13 (Yes), Step S14 is proceeded to, and in Step S14 the update information is copied from the area where it is temporarily stored in the above-mentioned RAM 15 to the area where the program actually operates. However, information on whether this update information has been sent or not is

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.