

BUNKERING RECEIPT ISSUANCE SYSTEM AND METHOD BASED ON SCHEME IN WHICH FUEL-FEEDING VESSEL SUPPLIES OIL FUEL TO FUEL- RECEIVING VESSEL ON SEA

BACKGROUND

Field

[0001] The present disclosure relates to a bunkering delivery receipt issuance system and method based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea.

Description of Related Art

[0002] Generally, a vehicle goes to a designated place such as a gas station to receive oil fuel, and a driver pays a fixed amount by credit card or cash according to an amount of supplied oil. In this way, when the refueling place is fixed on the ground, a payment system based on the supplied amount is well equipped at present.

[0003] However, a vessel operating on the sea which has anchored in a port has to return to an oil receiving site whenever receiving the oil fuel. This may cause excessive time and cost to be consumed.

[0004] For this reason, for vessel-fueling, a fuel-feeding vessel is generally used to supply the oil fuel to a fuel-receiving vessel on the sea.

[0005] However, conventionally, when the fuel-feeding vessel completes supplying the oil fuel to the fuel-receiving vessel, a bunkering agent that manages the fuel-feeding vessel carries a paper-type (e.g., carbon paper type) bunkering delivery receipt and obtains a signature of a manager of a shipment port, a manager of the fuel-feeding vessel, and an engine manager or a captain of the fuel-receiving vessel. This bunkering delivery receipt may be composed of a total of 9 pieces of carbon-papers.

[0006] Moreover, the bunkering delivery receipt having the signature completed thereon is scanned and the scan copy is delivered to an oil company, an unloading location, a bunkering agent, and an engine manager (captain) or an owner of the fuel-receiving vessel via a mail.

[0007] FIG. 1 is an illustrative diagram showing a conventional bunkering delivery receipt.

[0008] Referring to FIG. 1, in a conventional bunkering delivery receipt 110, information about the refueling is input through handwriting. Thus, it is difficult to recognize the input handwriting, and further, there is a possibility of loss thereof.

[0009] Thus, in the prior art, in order to receive the signature on the bunkering delivery receipt, each manager or the engine manager is individually visited to receive the signature thereof. Thus, there may be inconvenience and the signed bunkering delivery receipt may be lost.

[0010] In addition, since the oil fuel is supplied on the sea, the fuel-feeding vessel and the fuel-receiving vessel may be shaken by the waves, and accordingly, the oil may not be supplied accurately in a supplied oil amount required by the fuel-receiving vessel. In addition, it is practically difficult to identify whether the supplied amount of the oil requested by the fuel-receiving vessel has been accurately supplied.

[0011] Further, since communication is usually disrupted on the sea, the prior art may not electronically deliver the bunkering delivery receipt. Further, the possibility of stealing the oil may not be fundamentally excluded in the prior art.

[0012] Therefore, it is necessary to accurately identify the amount of oil supplied to the fuel-receiving vessel on the sea to prevent the possibility of stealing the oil.

[0013] Further, there is a need to electronically signing a signature on and performing issuance of the bunkering delivery receipt based on a fueling scheme of supplying oil fuel on the sea, and to transmit the bunkering delivery receipt wirelessly.

SUMMARY

[0014] Conventionally, when fueling a fuel-receiving vessel on the sea, there is a possibility of stealing the fuel, and electronic issuance of the bunkering delivery receipt is not possible.

[0015] Therefore, a purpose of the present disclosure is to provide a bunkering delivery receipt issuance system and method based on a scheme in which a fuel-feeding vessel feeds the oil to a fuel-receiving vessel on the sea such that the possibility of stealing the oil is fundamentally prevented, and the bunkering delivery receipt is electronically issued.

[0016] Further, a purpose of the present disclosure is to provide a bunkering delivery receipt issuance device and method based on a scheme in which a fuel-feeding vessel feeds oil to a

fuel-receiving vessel on the sea in which the bunkering delivery receipt is issued via an application and is sent to a destination via an email.

[0017] Further, a purpose of the present disclosure is to provide a bunkering delivery receipt issuance device and method based on a scheme in which a fuel-feeding vessel feeds oil to a fuel-receiving vessel on the sea in which electronic issuance of the bunkering delivery receipt is performed via an application, thereby improving an issuance process of the bunkering delivery receipt based on the paper.

[0018] Further, a purpose of the present disclosure is to provide a bunkering delivery receipt issuance system and method based on a scheme in which a fuel-feeding vessel feeds the oil to a fuel-receiving vessel on the sea in which a bunkering agent accesses an application in an ID scheme, receives a signature through the application from the unloading location, the manager of the fuel-feeding vessel, and the engine manager of the fuel-receiving vessel, and automatically sends the bunkering delivery receipt to a manager related to the oil fueling via an email.

[0019] Purposes of the present disclosure are not limited to the above-mentioned purpose. Other purposes and advantages of the present disclosure that are not mentioned may be understood based on following descriptions, and may be more clearly understood based on embodiments of the present disclosure. Further, it will be easily understood that the purposes and advantages of the present disclosure may be realized using means shown in the claims and combinations thereof.

[0020] To achieve the above purposes, a method and a system according to the present disclosure may issue a bunkering delivery receipt based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea through an application of a portable terminal, and transmits the receipt to a destination.

[0021] Further, a method and a system according to the present disclosure may receive a signature of each of the oil company's manager, the fuel-feeding vessel's manager, and the fuel-receiving vessel's manager through the application and create a bunkering delivery receipt based on the received signature.

[0022] Further, a method and a system according to the present disclosure may store therein the bunkering delivery receipt in a memory when communication is lost while fueling the ship

on the sea, and automatically transmit the bunkering delivery receipt to the destination when the communication is established.

[0023] A first aspect of the present disclosure to achieve the purpose provides a bunkering delivery receipt issuance system based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea, the system comprising: an oil company server configured to transmit information about supplying of the oil fuel to at least one fuel-receiving vessel to a bunkering delivery receipt issuance device; and the bunkering delivery receipt issuance device configured to issue the bunkering delivery receipt related to the supply of the oil fuel, wherein the bunkering delivery receipt issuance device is configured to: display the information received from the oil company server on a screen of an application; display, on the screen, a start time at which the fuel-feeding vessel supplies the oil fuel to the fuel-receiving vessel, and a termination time of the supply of the oil fuel to the fuel-receiving vessel; receive, via the screen, a signature related to the fuel supply from each of manager of an oil company, a manager of the fuel-feeding vessel, and a manager of the fuel-receiving vessel; generate a bunkering delivery receipt related to the fuel supply to the fuel-receiving vessel, based on the received signatures; and automatically transmit the generated bunkering delivery receipt to at least one designated email.

[0023a] Disclosed herein is a bunkering delivery receipt issuance system based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea, the system comprising: an oil company server configured to transmit information about supplying of the oil fuel to at least one fuel-receiving vessel to a bunkering delivery receipt issuance device; and the bunkering delivery receipt issuance device configured to issue the bunkering delivery receipt related to the supply of the oil fuel, wherein the bunkering delivery receipt issuance device is configured to: display a screen including the information received from the oil company server on a first application; display, on the screen of the first application, a start time at which the fuel-feeding vessel supplies the oil fuel to the fuel-receiving vessel and a termination time of the supply of the oil fuel to the fuel-receiving vessel; receive, through a second application, a signature related to the fuel supply from each of a mobile terminal of a manager of an oil company, a mobile terminal of a manager of the fuel-feeding vessel, and a mobile terminal of a manager of the fuel-receiving vessel; generate a bunkering delivery receipt related to the fuel supply to the fuel-receiving vessel, based on the received signatures; and automatically transmit the generated bunkering delivery receipt to at least one designated email,

wherein the bunkering delivery receipt issuance device is further configured to: identify whether the signature is entered through the second application by synchronization between the first application and the second application, store the generator bunkering delivery receipt in a memory of the bunkering delivery receipt issuance device when the bunkering delivery receipt issuance device is not located in a wireless communication service area while fueling the fuel-receiving vessel at sea, and automatically transmit the stored bunkering delivery receipt to the at least one designated email through the first application when the bunkering delivery receipt issuance device is located in the wireless communication service area.

[0024] In one implementation of the first aspect, the bunkering delivery receipt issuance device is further configured to receive the start time and the termination time from at least one sensor attached to an oil supply pipe through which the oil fuel is delivered from the fuel-feeding vessel to the fuel-receiving vessel.

[0025] In one implementation of the first aspect, the bunkering delivery receipt issuance device is further configured to: calculate a total supplied oil amount supplied for a time duration from the start time to the termination time; compare the calculated total supplied oil amount with an average oil amount as expected to be supplied for the time duration; and determine, based on the comparing result, whether a difference between the calculated total supplied oil amount and the average oil amount falls within a predefined range.

[0026] In one implementation of the first aspect, the bunkering delivery receipt issuance device is further configured to notify an alarm through the application when the difference between the calculated total supplied oil amount and the average oil amount does not fall within the predefined range.

[0027] In one implementation of the first aspect, the bunkering delivery receipt issuance device is further configured to: identify whether the device is located in a wireless communication service area; and when the device is not located in the wireless communication service area, store the generated bunkering delivery receipt in a memory.

[0028] In one implementation of the first aspect, the bunkering delivery receipt issuance device is further configured to automatically transmit the stored bunkering delivery receipt to the at least one email when the device is located in the wireless communication service area.

[0029] In one implementation of the first aspect, the application includes information on at least some of a list of fuel-receiving vessels awaiting fuel-receiving, a fuel type, a fuel quantity, a fueling inspection result, and IMO (International Maritime Organization) regulations.

[0030] In one implementation of the first aspect, the generated bunkering delivery receipt includes at least one of information on a name of an oil company, unloading location information, supply location information, information on the fuel-feeding vessel, information on a bunkering agent, the start time, the termination time, a fueling date, a supplied oil amount, a ratio of an actually supplied oil amount to a requested oil amount, a fueling analysis result, and a sulfur content.

[0031] A second aspect of the present disclosure to achieve the purpose provides a bunkering delivery receipt issuance method performed by a bunkering delivery receipt issuance system based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea, the method comprising: transmitting, by an oil company server, information about supplying of the oil fuel to at least one fuel-receiving vessel to a bunkering delivery receipt issuance device; displaying, by the bunkering delivery receipt issuance device, the information received from the oil company server on a screen of an application; displaying, by the bunkering delivery receipt issuance device, on the screen, a start time at which the fuel-feeding vessel supplies the oil fuel to the fuel-receiving vessel, and a termination time of the supply of the oil fuel to the fuel-receiving vessel; receiving, by the bunkering delivery receipt issuance device, via the screen, a signature related to the fuel supply from each of manager of an oil company, a manager of the fuel-feeding vessel, and a manager of the fuel-receiving vessel; generating, by the bunkering delivery receipt issuance device, a bunkering delivery receipt related to the fuel supply to the fuel-receiving vessel, based on the received signatures; and automatically transmitting, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt to at least one designated email.

[0031a] Disclosed herein a bunkering delivery receipt issuance method performed by a bunkering delivery receipt issuance system based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea, the method comprising: transmitting, by an oil company server, information about supplying of the oil fuel to at least one fuel-receiving vessel to a bunkering delivery receipt issuance device; displaying, by the bunkering delivery receipt issuance device, the information received from the oil company server on a screen of a

first application; displaying, by the bunkering delivery receipt issuance device, on the screen of the first application, a start time at which the fuel-feeding vessel supplies the oil fuel to the fuel-receiving vessel, and a termination time of the supply of the oil fuel to the fuel-receiving vessel; receiving, by the bunkering delivery receipt issuance device, through a second application, a signature related to the fuel supply from each of a mobile terminal of a manager of an oil company, a mobile terminal of a manager of the fuel-feeding vessel, and a mobile terminal of a manager of the fuel-receiving vessel; generating, by the bunkering delivery receipt issuance device, a bunkering delivery receipt related to the fuel supply to the fuel-receiving vessel, based on the received signatures; and automatically transmitting, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt to at least one designated email, wherein generating, by the bunkering delivery receipt issuance device, the bunkering delivery receipt comprises identifying whether the signature is entered through the second application by synchronization between the first application and the second application, and wherein automatically transmitting, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt comprises: storing the generator bunkering delivery receipt in a memory of the bunkering delivery receipt issuance device when the bunkering delivery receipt issuance device is not located in a wireless communication service area while fueling the fuel-receiving vessel at sea; and automatically transmitting the stored bunkering delivery receipt to the at least one designated email through the first application when the bunkering delivery receipt issuance device is located in the wireless communication service area.

[0032] In one implementation of the second aspect, displaying, by the bunkering delivery receipt issuance device, on the screen, the start time and the termination time includes receiving, by the bunkering delivery receipt issuance device, the start time and the termination time from at least one sensor attached to an oil supply pipe through which the oil fuel is delivered from the fuel-feeding vessel to the fuel-receiving vessel.

[0033] In one implementation of the second aspect, generating, by the bunkering delivery receipt issuance device, the bunkering delivery receipt includes: calculating, by the bunkering delivery receipt issuance device, a total supplied oil amount supplied for a time duration from the start time to the termination time; comparing, by the bunkering delivery receipt issuance device, the calculated total supplied oil amount with an average oil amount as expected to be supplied for the time duration; and determining, by the bunkering delivery receipt issuance

device, based on the comparing result, whether a difference between the calculated total supplied oil amount and the average oil amount falls within a predefined range.

[0034] In one implementation of the second aspect, determining, by the bunkering delivery receipt issuance device, based on the comparing result, whether the difference between the calculated total supplied oil amount and the average oil amount falls within the predefined range includes notifying, by the bunkering delivery receipt issuance device, an alarm through the application when the difference between the calculated total supplied oil amount and the average oil amount does not fall within the predefined range.

[0035] In one implementation of the second aspect, automatically transmitting, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt to the at least one designated email includes: identifying, by the bunkering delivery receipt issuance device, whether the device is located in a wireless communication service area; and when the device is not located in the wireless communication service area, storing, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt in a memory.

[0036] In one implementation of the second aspect, automatically transmitting, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt to the at least one designated email includes automatically transmitting, by the bunkering delivery receipt issuance device, the stored bunkering delivery receipt to the at least one email when the device is located in the wireless communication service area.

[0037] A third aspect of the present disclosure to achieve the purpose provides a bunkering delivery receipt issuance device based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea, the device comprising: a communication unit; a display; a processor electrically connected to the communication unit and the display; and a memory electrically connected to the processor, wherein the memory stores therein instructions, wherein when the instructions are executed by the processor, the instructions cause the processor to: receive information about supplying of oil fuel to at least one fuel-receiving vessel from an oil company server via the communication unit; display the information received from the oil company server on a screen of an application on the display; display, on the screen, a start time at which the fuel-feeding vessel supplies the oil fuel to the fuel-receiving vessel, and a termination time of the supply of the oil fuel to the fuel-receiving vessel; receive, via the screen, a signature related to the fuel supply from each of manager of an oil company, a

manager of the fuel-feeding vessel, and a manager of the fuel-receiving vessel; generate a bunkering delivery receipt related to the fuel supply to the fuel-receiving vessel, based on the received signatures; and automatically transmit the generated bunkering delivery receipt to at least one designated email via the communication unit.

[0037a] Disclosed herein a bunkering delivery receipt issuance device based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea, the device comprising: a communication unit; a display; a processor electrically connected to the communication unit and the display; and a memory electrically connected to the processor, wherein the memory stores therein instructions, wherein when the instructions are executed by the processor, the instructions cause the processor to: receive information about supplying of oil fuel to at least one fuel-receiving vessel from an oil company server via the communication unit; display the information received from the oil company server on a screen of a first application on the display; display, on the screen of the first application, a start time at which the fuel-feeding vessel supplies the oil fuel to the fuel-receiving vessel, and a termination time of the supply of the oil fuel to the fuel-receiving vessel; receive, through a second application, a signature related to the fuel supply from each of a mobile terminal of a manager of an oil company, a mobile terminal of a manager of the fuel-feeding vessel, and a mobile terminal of a manager of the fuel-receiving vessel; generate a bunkering delivery receipt related to the fuel supply to the fuel-receiving vessel, based on the received signatures; and automatically transmit the generated bunkering delivery receipt to at least one designated email via the communication unit, wherein the bunkering delivery receipt issuance device is further configured to: identify whether the signature is entered through the second application by synchronization between the first application and the second application, store the generated bunkering delivery receipt in a memory of the bunkering delivery receipt issuance device when the bunkering delivery receipt issuance device is not located in a wireless communication service area while fueling the fuel-receiving vessel at sea, and automatically transmit the stored bunkering delivery receipt to the at least one designated email through the first application when the bunkering delivery receipt issuance device is located in the wireless communication service area.

[0038] In one implementation of the third aspect, when the instructions are executed by the processor, the instructions cause the processor to receive the start time and the termination time from at least one sensor attached to an oil supply pipe through which the oil fuel is delivered from the fuel-feeding vessel to the fuel-receiving vessel.

[0039] In one implementation of the third aspect, when the instructions are executed by the processor, the instructions cause the processor to: calculate a total supplied oil amount supplied for a time duration from the start time to the termination time; compare the calculated total supplied oil amount with an average oil amount as expected to be supplied for the time duration; and determine, based on the comparing result, whether a difference between the calculated total supplied oil amount and the average oil amount falls within a predefined range.

[0040] In one implementation of the third aspect, when the instructions are executed by the processor, the instructions cause the processor to notify an alarm through the application when the difference between the calculated total supplied oil amount and the average oil amount does not fall within the predefined range.

[0041] In one implementation of the third aspect, when the instructions are executed by the processor, the instructions cause the processor to: identify whether the device is located in a wireless communication service area; and when the device is not located in the wireless communication service area, store the generated bunkering delivery receipt in a memory.

[0042] In one implementation of the third aspect, when the instructions are executed by the processor, the instructions cause the processor to automatically transmit the stored bunkering delivery receipt to the at least one email when the device is located in the wireless communication service area.

[0043] A fourth aspect of the present disclosure to achieve the purpose provides a bunkering delivery receipt issuance method performed by a bunkering delivery receipt issuance device based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea, the method comprising: receiving, by the bunkering delivery receipt issuance device, information about supplying of the oil fuel to at least one fuel-receiving vessel from the oil company server; displaying, by the bunkering delivery receipt issuance device, the information received from the oil company server on a screen of an application; displaying, by the bunkering delivery receipt issuance device, on the screen, a start time at which the fuel-feeding vessel supplies the oil fuel to the fuel-receiving vessel, and a termination time of the supply of the oil fuel to the fuel-receiving vessel; receiving, by the bunkering delivery receipt issuance device, via the screen, a signature related to the fuel supply from each of manager of an oil company, a manager of the fuel-feeding vessel, and a manager of the fuel-receiving vessel; generating, by the bunkering delivery receipt issuance device, a bunkering delivery receipt

related to the fuel supply to the fuel-receiving vessel, based on the received signatures; and automatically transmitting, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt to at least one designated email.

[0043a] Disclosed herein a bunkering delivery receipt issuance method performed by a bunkering delivery receipt issuance device based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea, the method comprising: receiving, by the bunkering delivery receipt issuance device, information about supplying of the oil fuel to at least one fuel-receiving vessel from the oil company server; displaying, by the bunkering delivery receipt issuance device, the information received from the oil company server on a screen of a first application; displaying, by the bunkering delivery receipt issuance device, on the screen of the first application, a start time at which the fuel-feeding vessel supplies the oil fuel to the fuel-receiving vessel, and a termination time of the supply of the oil fuel to the fuel-receiving vessel; receiving, by the bunkering delivery receipt issuance device, through a second application, a signature related to the fuel supply from each of a mobile terminal of a manager of an oil company, a mobile terminal of a manager of the fuel-feeding vessel, and a mobile terminal of a manager of the fuel-receiving vessel; generating, by the bunkering delivery receipt issuance device, a bunkering delivery receipt related to the fuel supply to the fuel-receiving vessel, based on the received signatures; and automatically transmitting, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt to at least one designated email, wherein generating, by the bunkering delivery receipt issuance device, the bunkering delivery receipt comprises identifying whether the signature is entered through the second application by synchronization between the first application and the second application, and wherein automatically transmitting, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt comprises: storing the generated bunkering delivery receipt in a memory of the bunkering delivery receipt issuance device when the bunkering delivery receipt issuance device is not located in a wireless communication service area while fueling the fuel-receiving vessel at sea; and automatically transmitting the stored bunkering delivery receipt to the at least one designated email through the first application when the bunkering delivery receipt issuance device is located in the wireless communication service area.

[0044] The method, device and system according to the present disclosure may display the screen including information received from the oil company server through the application,

and display the start time and the termination time of the oil fuel supply to the fuel-receiving vessel on the screen, so that an exact time duration for which the oil fuel is supplied and an exact supplied oil amount may be identified.

[0045] Further, the method, device and system according to the present disclosure may receive, via the screen, the signature related to the fuel supply from each of manager of an oil company, a manager of the fuel-feeding vessel, and a manager of the fuel-receiving vessel and generate the bunkering delivery receipt related to the fuel supply to the fuel-receiving vessel, based on the received signatures; and automatically transmit the generated bunkering delivery receipt to at least one designated email. Thus, the bunkering delivery receipt may be quickly delivered to the related managers.

[0046] Further, the method, device and system according to the present disclosure may utilize the application to electronically issue the bunkering delivery receipt, thereby improving the current paper-based issuance process of the bunkering delivery receipt, thereby increasing work efficiency and reducing the likelihood of stealing the oil.

[0047] Further, the method, device and system according to the present disclosure may receive the start time and the termination time from at least one sensor attached to an oil supply pipe through which the oil fuel is delivered from the fuel-feeding vessel to the fuel-receiving vessel, so that an exact time duration for which the oil fuel is supplied and an exact supplied oil amount may be identified.

[0048] Further, the method, device and system according to the present disclosure may calculate a total supplied oil amount supplied for a time duration from the start time to the termination time; compare the calculated total supplied oil amount with an average oil amount as expected to be supplied for the time duration; and determine, based on the comparing result, whether a difference between the calculated total supplied oil amount and the average oil amount falls within a predefined range, thereby accurately determining the amount of supplied oil actually supplied to the fuel-receiving vessel.

[0049] Further, the method, device and system according to the present disclosure may notify an alarm through the application when the difference between the calculated total supplied oil amount and the average oil amount does not fall within the predefined range, thereby notifying

the manager that the difference between the actually supplied amount and the requested amount occurs.

[0050] Further, the method, device and system according to the present disclosure may notify the oil company through the application that a difference between the fueling start time and the fueling termination time supplied to the fuel-receiving vessel does not fall within a certain range, thereby notifying the manager that the difference between the actually supplied amount and the requested amount occurs.

[0051] Further, the method, device and system according to the present disclosure may identify whether the device is located in a wireless communication service area; and when the device is not located in the wireless communication service area, store the generated bunkering delivery receipt in a memory. This may convert many bunkering delivery receipts into electronical data.

[0052] Further, the method, device and system according to the present disclosure may automatically transmit the stored bunkering delivery receipt to the at least one email when the device is located in the wireless communication service area, thereby shortening a delivery time of the bunkering delivery receipt.

[0053] Further, the method, device and system according to the present disclosure may store the bunkering delivery receipt in the oil company server, thereby excluding the risk of loss thereof.

[0054] Further, in the method, device and system according to the present disclosure, when the bunkering agent electronically enters a fueling supply date for the bunkering delivery receipt issuance, the date may be automatically input in the oil company's ERP system, thereby enabling electronic payment for the fueling.

[0055] Further, in the method, device and system according to the present disclosure, the information on at least some of a list of fuel-receiving vessels awaiting fuel-receiving, a fuel type, a fuel quantity, a fueling inspection result, and IMO (International Maritime Organization) regulations may be displayed on the screen of the application. Thus, the information related to the fuel supply may be checked.

[0056] Further, in the method, device and system according to the present disclosure, the generated bunkering delivery receipt includes at least one of information on a name of an oil company, unloading location information, supply location information, information on the fuel-feeding vessel, information on a bunkering agent, the start time, the termination time, a fueling date, a supplied oil amount, a ratio of an actually supplied oil amount to a requested oil amount, a fueling analysis result, and a sulfur content. Thus, various information based on fueling may be checked.

[0057] Effects of the present disclosure are not limited to the above-mentioned effects, and other effects as not mentioned will be clearly understood by those skilled in the art from following descriptions.

BRIEF DESCRIPTION OF DRAWINGS

[0058] FIG. 1 is an illustrative diagram showing a conventional bunkering delivery receipt.

[0059] FIG. 2 is an illustrative diagram showing a state in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea according to one embodiment of the present disclosure.

[0060] FIG. 3 is a block diagram showing a bunkering delivery receipt issuance system based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea according to one embodiment of the present disclosure.

[0061] FIG. 4 is a flowchart showing a bunkering delivery receipt issuance process based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea according to one embodiment of the present disclosure.

[0062] FIG. 5A is an illustrative diagram of an initial screen of an application that issues a bunkering delivery receipt based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea according to one embodiment of the present disclosure.

[0063] FIG. 5B is an illustrative diagram of a screen of an application displaying a fueling wait list according to one embodiment of the present disclosure.

[0064] FIG. 5C is a first illustrative diagram of a screen on which an application displays information received from an oil company server according to one embodiment of the present disclosure.

[0065] FIG. 5D is a second illustrative diagram of a screen in which an application displays information received from an oil company server according to one embodiment of the present disclosure.

[0066] FIG. 5E is a third illustrative diagram of a screen in which an application displays information received from an oil company server according to one embodiment of the present disclosure.

[0067] FIG. 5F is an illustrative diagram of a screen of an application for receiving an email of a recipient additionally receiving a bunkering delivery receipt according to one embodiment of the present disclosure.

[0068] FIG. 5G is an illustrative diagram of a screen of an application for receiving a signature according to one embodiment of the present disclosure.

[0069] FIG. 6 is an illustrative diagram showing a bunkering delivery receipt according to one embodiment of the present disclosure.

[0070] FIG. 7 is an illustrative diagram showing that a bunkering delivery receipt has been sent to a designated email according to one embodiment of the present disclosure.

DETAILED DESCRIPTIONS

[0071] Advantages and features of the present disclosure, and a method of achieving the advantages and features will become apparent with reference to embodiments described later in detail together with the accompanying drawings. However, the present disclosure is not limited to the embodiments as disclosed below, but may be implemented in various different forms. Thus, these embodiments are set forth only to make the present disclosure complete, and to completely inform the scope of the present disclosure to those of ordinary skill in the technical field to which the present disclosure belongs, and the present disclosure is only defined by the scope of the claims.

[0072] The terminology used herein is directed to the purpose of describing particular embodiments only and is not intended to be limiting of the present disclosure. As used herein, the singular constitutes "a" and "an" are intended to include the plural constitutes as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprise", "including", "include", and "including" when used in this specification, specify the presence of the stated features, integers, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, operations, elements, components, and/or portions thereof. As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items. Expression such as "at least one of" when preceding a list of elements may modify the entire list of elements and may not modify the individual elements of the list. In interpretation of numerical values, an error or tolerance therein may occur even when there is no explicit description thereof.

[0073] In descriptions of temporal relationships, for example, temporal precedent relationships between two events such as "after", "subsequent to", "before", etc., another event may occur therebetween unless "directly after", "directly subsequent" or "directly before" is not indicated.

[0074] It will be understood that, although the terms "first", "second", "third", and so on may be used herein to describe various elements, components, regions, layers and/or sections, these elements, components, regions, layers and/or sections should not be limited by these terms. These terms are used to distinguish one element, component, region, layer or section from another element, component, region, layer or section. Thus, a first element, component, region, layer or section described below could be termed a second element, component, region, layer or section, without departing from the spirit and scope of the present disclosure.

[0075] The features of the various embodiments of the present disclosure may be partially or entirely combined with each other, and may be technically associated with each other or operate with each other. The embodiments may be implemented independently of each other and may be implemented together in an association relationship.

[0076] It will be understood that when an element or layer is referred to as being "connected to", or "coupled to" another element or layer, it may be directly on, connected to, or coupled to the other element or layer, or one or more intervening elements or layers may be present. In addition, it will also be understood that when an element or layer is referred to as being

"between" two elements or layers, it may be the only element or layer between the two elements or layers, or one or more intervening elements or layers may also be present.

[0077] Unless otherwise defined, all terms including technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this inventive concept belongs. It will be further understood that terms, such as those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[0078] Hereinafter, a bunkering delivery receipt issuance system and method and a bunkering delivery receipt issuance device based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea according to some embodiments of the present disclosure will be described.

[0079] FIG. 2 is an illustrative diagram showing a state in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea according to one embodiment of the present disclosure.

[0080] Referring to FIG. 2, according to the present disclosure, a fuel-feeding vessel 210 that supplies oil fuel to at least one fuel-receiving vessel 220 and the fuel-receiving vessel 220 that receives oil fuel from the fuel-feeding vessel 210 are located on the sea. Moreover, the fuel-feeding vessel 210 and the fuel-receiving vessel 220 are connected to each other through an oil supply pipe 230, and the oil fuel is supplied from the vessel 210 to the vessel 220 through the oil supply pipe 230. The fuel-feeding vessel 210 and the fuel-receiving vessel 220 are located on the sea where no communication connection is established.

[0081] According to one embodiment, the fuel-feeding vessel 210 and the fuel-receiving vessel 220 are not anchored at a port, and the fuel-feeding vessel 210 is owned or managed by a bunkering agent.

[0082] FIG. 3 is a block diagram showing a bunkering delivery receipt issuance system based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea according to one embodiment of the present disclosure.

[0083] Referring to FIG. 3, a bunkering delivery receipt issuance system 300 based on the scheme in which the fuel-feeding vessel supplies oil fuel to the fuel-receiving vessel on the sea according to one embodiment of the present disclosure include at least one sensor 310, a bunkering delivery receipt issuance device 320, and an oil company server 330.

[0084] A configuration of the bunkering delivery receipt issuance system 300 shown in FIG. 3 is merely based on one embodiment. The configuration of the bunkering delivery receipt issuance system 300 is not limited to the embodiment shown in FIG. 3. Some components may be added, changed, or deleted as needed.

[0085] According to one embodiment, the at least one sensor 310 is disposed at one side of the oil supply pipe 230 to which oil fuel is supplied, and detects supply of oil fuel from the fuel-feeding vessel 210 to the fuel-receiving vessel 220, and whether fueling is terminated. Moreover, the at least one sensor 310 wirelessly transmits a signal based on detection of start of the supply of oil fuel and a signal based on termination of supply of oil fuel to the bunkering delivery receipt issuance device 320. Based on the signals, the bunkering delivery receipt issuance device 320 may determine an amount of supplied oil supplied to the fuel-receiving vessel 220.

[0086] According to one embodiment, the bunkering delivery receipt issuance device 320 may include a communication unit 321, a memory 322, a display 323 and a processor 324.

[0087] According to one embodiment, the communication unit 321 may perform wireless communication with the at least one sensor 310 and the oil company server 330 in a predetermined scheme. The communication unit 321 receives information about supplying of oil fuel to at least one fuel-receiving vessel from the oil company server 330. The information includes information on at least some of a list of at least one fuel-receiving vessel awaiting oil-receiving, a fuel type, a quantity, a fueling inspection result, and IMO (International Maritime Organization) regulations.

[0088] According to one embodiment, the communication unit 321 may transmit a control signal for controlling an oil supply amount supplied to the fuel-receiving vessel 220, and a supply rate thereof. The communication unit 321 may be automatically switched to an inactive mode when a current area is out of a communication service area on the sea. Alternatively, the communication unit 321 periodically scans a communication channel in a state where the

current area is out of the communication service area on the sea. When the communication channel is found, the communication unit automatically performs wireless communication through the communication channel.

[0089] According to one embodiment, the memory 322 may include volatile and/or non-volatile memory. The memory 322 may store therein, for example, a command or data related to at least one other component of the bunkering delivery receipt issuance device 320. The memory 322 may store therein at least some of instructions, an algorithm, an application, a software and a program required to supply oil fuel to the fuel-receiving vessel 220, receive a fueling time, and receive a signature from at least one manager.

[0090] According to one embodiment, the memory 322 may store therein the bunkering delivery receipt generated from the bunkering delivery receipt issuance device 320. For example, when a connection to an external network is established through the communication unit 321, the memory 322 may automatically read the bunkering delivery receipt stored therein by the processor 324.

[0091] According to one embodiment, the memory 322 may store therein information on an oil company name, unloading location information, supply location information, information on the fuel-feeding vessel, information on a bunkering agent, a fueling start time, a fueling termination time, a fueling date, a supplied oil amount, a ratio of a supplied oil amount to a requested oil supply amount, information on a fueling analysis result, and information on a sulfur content.

[0092] According to one embodiment, the memory 322 may store therein various information received from the at least one sensor 310 and the oil company server 330.

[0093] According to one embodiment, the display 323 may display various information about a fueling status (for example, whether fueling is currently ongoing, whether fueling is terminated, a fueling time, an expected fueling completion time, fueling information, various screens of an application that issues the bunkering delivery receipt, etc.). The display 323 may receive an input via touch or hovering.

[0094] According to one embodiment, the processor 324 may control overall operations of the bunkering delivery receipt issuance device 320. The processor 324 may control overall operations of the bunkering delivery receipt issuance device 320 using an algorithm, a program,

or an application required for control as read from the memory 322. The processor 324 may be implemented in a form of a CPU, a microprocessor, or a minicomputer.

[0095] According to one embodiment, the processor 324 wirelessly receives information about supplying of oil fuel to at least one fuel-receiving vessel through the communication unit 321. For example, the processor 324 may wirelessly receive information about supplying of oil fuel to a fuel-receiving vessel transmitted from the oil company server 330 on the sea.

[0096] According to one embodiment, the processor 324 may display information received from the oil company server 330 through an application. The information may include information on at least some of a list of fuel-receiving vessels awaiting fuel-receiving, a fuel type, a quantity, a fueling inspection result, and International Maritime Organization (IMO) regulations. The application (for example, e-BDR (Bunkering Delivery Receipt)) may issue an electronic receipt related to supply of the oil fuel supplied to the fuel-receiving vessel. Moreover, the application automatically transmits the bunkering delivery receipt when the communication unit 321 is in an active state, that is, when communication with an external device (for example, the oil company server 330) is established.

[0097] According to one embodiment, the processor 324 displays a fueling start time at which the oil fuel starts to be supplied to the fuel-receiving vessel 220 and a fueling termination time at which the supply is terminated on a screen of the application. The processor 324 may receive the start time at which oil fuel is supplied to the fuel-receiving vessel 220 and the termination time at which the supply of oil fuel is terminated from the at least one sensor 310 attached to the oil supply pipe 230 through the communication unit 321.

[0098] According to one embodiment, the processor 324 calculates the total supplied oil amount delivered for a duration between the start time and the termination time, and compares the calculated total supplied oil amount with an average supplied oil amount as expected to be supplied for the same time duration. The processor 324 calculates the total amount of supplied oil supplied to the fuel-receiving vessel 220 based on the start time and the termination time. For example, the processor 324 may calculate the total amount of supplied oil delivered for the duration between the start time and the termination time, based on an amount of oil fuel supplied per unit time.

[0099] According to one embodiment, the processor 324 compares the calculated total supplied oil amount (that is, the total supplied oil amount actually supplied to the fuel-receiving vessel 220) with the average supplied oil amount as expected to be supplied for the same time duration. The average supplied oil amount theoretically refers to a supplied oil amount calculated by multiplying an average value of a supplied oil amount per unit time by the time duration between the start time and the termination time. Thus, the processor 324 may identify whether the amount of supplied oil actually supplied to the fuel-receiving vessel 220 exceeds or does not exceed the average amount of supplied oil. The processor 324 may determine whether a difference between the total amount of supplied oil actually supplied to the fuel-receiving vessel 220 and the amount of supplied oil requested by the fuel-receiving vessel 220 falls within a certain range (for example, 0.1 tons), and may identify, based on the determination result, whether the amount of supplied oil supplied to the fuel-receiving vessel 220 exceeds or does not exceed the average amount of supplied oil.

[00100] According to one embodiment, when the difference between the amount of supplied oil supplied to the fuel-receiving vessel 220 and the amount of supplied oil requested by the fuel-receiving vessel 220 does not fall within the predetermined range (for example, 0.1 ton), the processor 324 may be configured to issue an alarm (for example, a sound or a pop-up) through the application.

[00101] According to one embodiment, the processor 324 calculates a ratio of the amount of supplied oil supplied to the fuel-receiving vessel 220 to the amount of supplied oil requested by the fuel-receiving vessel 220, and creates the bunkering delivery receipt including the calculated ratio. The bunkering delivery receipt may include a difference between the amount of supplied oil supplied to the fuel-receiving vessel 220 and the amount of supplied oil requested by the fuel-receiving vessel 220.

[00102] According to one embodiment, when the processor receives the signature related to the fueling from each of the manager of the oil company, the manager of the fuel-feeding vessel, and the manager of the fuel-receiving vessel through the application, the processor 324 automatically generates the bunkering delivery receipt related to the fueling of the fuel-receiving vessel 220.

[00103] The generated bunkering delivery receipt may include information on an oil company name, unloading location information, supply location information, information on

the fuel-feeding vessel, information on a bunkering agent, a fueling start time, a fueling termination time, a fueling date, a supplied oil amount, a ratio of a supplied oil amount to a requested oil supply amount, information on a fueling analysis result, and information on a sulfur content.

[00104] According to one embodiment, the processor 324 automatically sends the generated bunkering delivery receipt to at least one designated email (for example, an email of an oil company manager, an email of a manager of a fuel-feeding vessel, an email of a manager of a fuel-receiving vessel, an email of an engine manager of the fuel-receiving vessel, an email of an owner of the fuel-receiving vessel, etc.).

[00105] According to one embodiment, the processor 324 identifies whether the bunkering delivery receipt issuance device 320 is currently located in the wireless communication service area. When the bunkering delivery receipt issuance device 320 is not located in the wireless communication service area, the processor 324 automatically saves the generated bunkering delivery receipt into the memory 322. A communication service may not be provided on the sea. To cope with this situation, the processor 324 stores the generated bunkering delivery receipt in the memory 322.

[00106] According to one embodiment, the processor 324 automatically transmits the bunkering delivery receipt stored in the memory 322 to the at least one email when the bunkering delivery receipt issuance device 320 enters or is located in the wireless communication service area.

[00107] According to one embodiment, in order to determine whether the bunkering delivery receipt issuance device 320 enters or is located in the wireless communication service area, the processor 324 periodically identifies whether connection of the communication channel is established through the communication unit 321.

[00108] According to one embodiment, the oil company server 330 transmits information about supplying of the oil fuel to at least one fuel-receiving vessel to the bunkering delivery receipt issuance device in which the application is installed. Moreover, the oil company server 330 receives the bunkering delivery receipt sent from the bunkering delivery receipt issuance device 320 via the email.

[00109] FIG. 4 is a flowchart showing a bunkering receipt issuance process based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea according to one embodiment of the present disclosure. FIG. 5A is an illustrative diagram of an initial screen of an application that issues a bunkering receipt based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea according to one embodiment of the present disclosure. FIG. 5B is an illustrative diagram of a screen of an application displaying a fueling wait list according to one embodiment of the present disclosure. FIG. 5C is a first illustrative diagram of a screen on which an application displays information received from an oil company server according to one embodiment of the present disclosure. FIG. 5D is a second illustrative diagram of a screen in which an application displays information received from an oil company server according to one embodiment of the present disclosure. FIG. 5E is a third illustrative diagram of a screen in which an application displays information received from an oil company server according to one embodiment of the present disclosure. FIG. 5F is an illustrative diagram of a screen of an application for receiving an email of a recipient additionally receiving a bunkering receipt according to one embodiment of the present disclosure. FIG. 5G is an illustrative diagram of a screen of an application for receiving a signature according to one embodiment of the present disclosure. FIG. 6 is an illustrative diagram showing a bunkering receipt according to one embodiment of the present disclosure. FIG. 7 is an illustrative diagram showing that a bunkering receipt has been sent to a designated email according to one embodiment of the present disclosure.

[00110] Hereinafter, with reference to FIG. 4 to FIG. 7, the bunkering delivery receipt issuance process based on the scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea according to one embodiment of the present disclosure will be described in detail.

[00111] According to one embodiment, the bunkering delivery receipt issuance device 320 (for example, the processor 324) receives fueling information about supply of oil fuel to the fuel-receiving vessel from the oil company server 330 in S410. The bunkering delivery receipt issuance device 320 (for example, the processor 324) may obtain the fueling information received through the application (for example, an application that issues the bunkering delivery receipt) installed in the memory 322.

[00112] According to one embodiment, the bunkering delivery receipt issuance device 320 (for example, processor 324) may receive various information about supplying of oil fuel to at least one fuel-receiving vessel from a server (for example, ERP (Enterprise Resource Planning)) as managed by the oil company server 330 (for example, a company that supplies the fuel) (for example, GS Caltex). The information may include at least some of information about the oil company name, unloading location information, supply location information, fuel-feeding vessel information, bunkering agent information, at least one fuel-receiving vessel list information (for example, customer information, product information, etc.), unloading location, supply location, bunkering agent information, fuel feeding vessel information, fuel types and quantities, fueling inspection results, and International Maritime Organization (IMO) regulations.

[00113] According to one embodiment, the bunkering delivery receipt issuance device 320 (for example, the processor 324) displays a screen including the received fueling information on the display 323 in S412. The bunkering delivery receipt issuance device 320 (for example, the processor 324) may display the screen including the fueling information received through the application on the display 323. For example, when user authentication related to the application is completed (for example, login is completed), the application may display the received fueling information on the display 323 under control of the processor 324.

[00114] Referring to FIG. 5A, the application that issues the bunkering delivery receipt may display a screen 510 including information on a terminal (for example, Yeosu, Busan, Incheon, etc.) 511, a fueling date (for example, March 1, 2021) 512, and a feeding state (for example, waiting for feeding, ongoing feeding, finished feeding) 513. After the information on a terminal (for example, Yeosu, Busan, Incheon, etc.) 511, a fueling date (for example, March 1, 2021) 512, and a feeding state (for example, waiting for feeding, ongoing feeding, finished feeding) 513 have inputted to the screen 510, the processor 324 may identify whether a document search menu 514 has been selected. When the document search menu 514 has been selected, the processor 324 displays a screen 520 of FIG. 5B through the application.

[00115] Referring to FIG. 5B, the application issuing the bunkering delivery receipt displays a plurality of fuel-receiving waiting lists 521, 522 and 523. Each list includes customer information and product information. Moreover, the processor 324 may identify which one list 521 is selected from among the displayed plurality of fuel-receiving waiting lists 521, 522 and

523. When the list 521 is selected, the processor 324 displays a screen 530 of FIG. 5C through the application.

[00116] Referring to FIG. 5C, the screen 530 includes detailed information about the list selected in FIG. 5B. The screen 530 may include an oil-receiving vessel name 531, an unloading location 532, a supply location 533, a fueling pumping start time 534, a fueling pumping termination time 535, and an IMO number 536. The screen 530 may include various information in addition to the above-described information.

[00117] Referring to FIG. 5D, when the screen 530 is scrolled down, a continuous screen 540 is displayed on the screen 530.

[00118] The screen 540 includes a fuel feeding vessel name or barge name 541, a bunkering agent information 542, an oil type, an amount of oil supplied 543, and sample information 544. The screen 540 may include various information in addition to the above-mentioned information.

[00119] Referring to FIG. 5E, when the screen 540 is scrolled down, a continuous screen 550 is displayed on the screen 540.

[00120] The screen 550 includes the sample information 544, and information on specification of the supplied oil 545 (for example, product name, density, viscosity, flash point, water & sediment VOL %, and information on sulfur WT%). The screen 550 may include various information in addition to the above-described information.

[00121] According to one embodiment, the bunkering delivery receipt issuance device 320 (for example, the processor 324) may identify whether the device receives the start time and the termination time of the fueling pumping from the at least one sensor measuring the amount of supplied oil supplied to the fuel-receiving vessel in S414.

[00122] According to one embodiment, the bunkering delivery receipt issuance device 320 (for example, the processor 324) inputs the start time and the termination time of fueling pumping to the screen in S416. When the supply of oil fuel starts, the bunkering delivery receipt issuance device 320 (for example, the processor 324) may input the start time to the application. When the supply of fuel is terminated, the bunkering delivery receipt issuance device 320 (for example, processor 324) may input the termination time thereto. The bunkering delivery receipt

issuance device 320 (for example, the processor 324) inputs the fueling pumping start time to a pumping start time menu 534 in FIG. 5C and inputs the fueling pumping termination time to a pumping termination time menu 535 in FIG. 5C.

[00123] Alternatively, the bunkering delivery receipt issuance device 320 (for example, the processor 324) may receive information on the start time of oil fuel supply and information on the oil fuel supply termination time from the sensor 310 measuring the amount of supplied oil supplied to the fuel-receiving vessel. The bunkering delivery receipt issuance device 320 (for example, the processor 324) inputs the start time received from the sensor 310 into the pumping start time menu 534 of FIG. 5C, and inputs the termination time received from the sensor 310 into the pumping termination time menu 535 of FIG. 5C.

[00124] According to one embodiment, the bunkering delivery receipt issuance device 320 (for example, the processor 324) identifies whether a recipient email address for receiving the receipt related to the fuel supplying to the fuel-receiving vessel has been obtained in S418. The bunkering delivery receipt issuance device 320 (for example, the processor 324) may automatically obtain a specified at least one email address.

[00125] Referring to FIG. 5F, the bunkering delivery receipt issuance device 320 (for example, the processor 324) may display a screen 560 for receiving an email address through the application. The screen 560 is displayed by scrolling the screen 550 in FIG. 5E.

[00126] The bunkering delivery receipt issuance device 320 (for example, the processor 324) may obtain at least one email to which the bunkering delivery receipt is sent. The email may include the oil company manager's email, the fuel-feeding vessel's manager's email, the fuel-receiving vessel's manager's email, the fuel-receiving vessel's engine manager's email, and the fuel-receiving vessel's owner's email. When the bunkering delivery receipt is created, the bunkering delivery receipt may be sent automatically to the email as designated. Therefore, there is no need to manually input an email address of the recipient (for example, oil company, bunkering agent, oil-receiving vessel, customer). Moreover, these emails are included in the information received from the oil company server.

[00127] According to one embodiment, the bunkering delivery receipt issuance device 320 (for example, the processor 324) may additionally obtain at least one email through the application (for example, the screen 560 of the application) in addition to the above-mentioned

emails (for example, the email of the manager of the oil company, the email of the manager of the fuel-feeding vessel, the email of the manager of the fuel-receiving vessel, the email of the engine manager of the fuel-receiving vessel, and the email of the owner of the fuel-receiving vessel). For example, the bunkering delivery receipt issuance device 320 (for example, the processor 324 may additionally acquire at least one email through an input window 561 of FIG. 5F.

[00128] Moreover, the screen 560 may include a window 562 that receives a memo to be transmitted and a window 563 that includes a check box for selecting an IMO regulation related to the type of oil supplied. The window 562 may be used to write a protest letter or a sample number for a fuel-receiving vessel.

[00129] According to one embodiment, the bunkering delivery receipt issuance device 320 (for example, the processor 324) identifies whether a signature from each of an oil company manager, and a manager of a fuel-feeding vessel that supplies fuel to the fuel-receiving vessel is input thereto in S420. The bunkering delivery receipt issuance device 320 (for example, the processor 324) may display a screen 570 for receiving at least one signature when a user scrolls down the screen 560.

[00130] For example, the screen 570 includes a window 571 in which the manager of the oil company signs a signature, a window 572 in which the manager of the fuel-feeding vessel signs a signature, and a window 573 in which the manager of the fuel-receiving vessel signs a signature. The application for receiving the signatures may be installed in each of a mobile terminal of the manager of the oil company, a mobile terminal of the manager of the fuel-feeding vessel, and a mobile terminal of the manager of the fuel-receiving vessel. Synchronization of data transmission and reception between the mobile terminals may be executed. The fuel-feeding vessel manager may receive a signature from the fuel-receiving vessel manager using his/her terminal.

[00131] For example, when the manager of the oil company signs a signature (for example, a first signature) through the application installed in the manager's mobile terminal, this signing of the signature is synchronized in the application of the fuel-feeding vessel manager's mobile terminal. Moreover, when the fuel-feeding vessel's manager signs a signature (for example, a second signature) through the application installed in the manager's mobile

terminal, this signing of the signature is synchronized in the application of the oil company's manager's mobile terminal.

[00132] Further, when the fuel-receiving vessel manager signs a signature (for example, a third signature) through the application of the fuel-feeding vessel manager terminal, this signature is provided to the application of the oil company's manager's mobile terminal.

[00133] According to one embodiment, when these first to third signatures are completed, the bunkering delivery receipt issuance device 320 (for example, the processor 324) may automatically generate the bunkering delivery receipt. For example, the first signature and the second signature may be canceled or changed until the third signature is input. However, when the third signature has been input, the first signature to third signature may not be canceled or changed.

[00134] According to one embodiment, the bunkering delivery receipt issuance device 320 (for example, the processor 324) generates the bunkering delivery receipt including information on the amount of actually supplied oil supplied to the fuel-receiving vessel in S422. The bunkering delivery receipt issuance device 320 (for example, processor 324) generates the bunkering delivery receipt when all these signatures are completed.

[00135] Referring to FIG. 6, the bunkering delivery receipt 610 may include various information such as the fueling information received in S410, information on fueling results (for example, actually supplied oil amount, oil sample information), payment details for supplied oil fuel, and information input through the application.

[00136] According to one embodiment, the bunkering delivery receipt issuance device 320 (for example, the processor 324) automatically transmits the generated bunkering delivery receipt to at least one designated email address in S424. The designated email address may include the email address of the oil company manager, the email address of the manager of the fuel-feeding vessel, the email address of the manager of the fuel-receiving vessel, the email address of the engine manager of the fuel-receiving vessel, and the email address of the owner of the fuel-receiving vessel. Alternatively, when there is a further email address input in FIG. 5F, the bunkering delivery receipt issuance device 320 (for example, the processor 324) optionally transmits the bunkering delivery receipt to the further email address.

[00137] Referring to FIG. 7, the sent email may include information 711 indicating a sulfur content (for example, 0.05% MGO), and a quantity. Further, the email sent should include the supply date, a BDR number, and a vessel name. Moreover, the bunkering delivery receipt is attached to the email.

[00138] The steps in each of the above-described flowcharts may be executed regardless of the illustrated order, or may be performed simultaneously. Further, at least one component of the present disclosure and at least one operation performed by the at least one component may be implemented in hardware and/or software.

[00139] The present disclosure has been described with reference to the illustrated drawings, but the present disclosure is not limited by the embodiments and drawings disclosed in the present specification. It is obvious that various modifications may be made by those skilled in the art within the scope of the technical idea of the present disclosure. In addition, even through the effects according to the configurations of the present disclosure have not been explicitly described when describing the embodiments of the present disclosure, it is apparent that predictable effects resulting from the configurations should also be appreciated.

WHAT IS CLAIMED IS:

1. A bunkering delivery receipt issuance system based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea, the system comprising:

an oil company server configured to transmit information about supplying of the oil fuel to at least one fuel-receiving vessel to a bunkering delivery receipt issuance device; and

the bunkering delivery receipt issuance device configured to issue the bunkering delivery receipt related to the supply of the oil fuel,

wherein the bunkering delivery receipt issuance device is configured to:

display a screen including the information received from the oil company server on a first application;

display, on the screen of the first application, a start time at which the fuel-feeding vessel supplies the oil fuel to the fuel-receiving vessel and a termination time of the supply of the oil fuel to the fuel-receiving vessel;

receive, through a second application, a signature related to the fuel supply from each of a mobile terminal of a manager of an oil company, a mobile terminal of a manager of the fuel-feeding vessel, and a mobile terminal of a manager of the fuel-receiving vessel;

generate a bunkering delivery receipt related to the fuel supply to the fuel-receiving vessel, based on the received signatures; and

automatically transmit the generated bunkering delivery receipt to at least one designated email,

wherein the bunkering delivery receipt issuance device is further configured to:

identify whether the signature is entered through the second application by synchronization between the first application and the second application,

store the generated bunkering delivery receipt in a memory of the bunkering delivery receipt issuance device when the bunkering delivery receipt issuance device is not

located in a wireless communication service area while fueling the fuel-receiving vessel at sea, and

automatically transmit the stored bunkering delivery receipt to the at least one designated email through the first application when the bunkering delivery receipt issuance device is located in the wireless communication service area.

2. The system of claim 1, wherein the bunkering delivery receipt issuance device is further configured to receive the start time and the termination time from at least one sensor attached to an oil supply pipe through which the oil fuel is delivered from the fuel-feeding vessel to the fuel-receiving vessel.

3. The system of claim 1, wherein the bunkering delivery receipt issuance device is further configured to:

calculate a total supplied oil amount supplied for a time duration from the start time to the termination time;

compare the calculated total supplied oil amount with an average oil amount as expected to be supplied for the time duration; and

determine, based on the comparing result, whether a difference between the calculated total supplied oil amount and the average oil amount falls within a predefined range.

4. The system of claim 3, wherein the bunkering delivery receipt issuance device is further configured to notify an alarm through the first application when the difference between the calculated total supplied oil amount and the average oil amount does not fall within the predefined range.

5. The system of claim 1, wherein the screen of the first application includes information on at least some of a list of fuel-receiving vessels awaiting fuel-receiving, a fuel type, a fuel quantity, a fueling inspection result, and IMO (International Maritime Organization) regulations.

6. The system of claim 1, wherein the generated bunkering delivery receipt includes at least one of information on a name of an oil company, unloading location information, supply location information, information on the fuel-feeding vessel, information on a bunkering agent, the start time, the termination time, a fueling date, a supplied oil amount, a ratio of an actually supplied oil amount to a requested oil amount, a fueling analysis result, and a sulfur content.

7. A bunkering delivery receipt issuance method performed by a bunkering delivery receipt issuance system based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea, the method comprising:

transmitting, by an oil company server, information about supplying of the oil fuel to at least one fuel-receiving vessel to a bunkering delivery receipt issuance device;

displaying, by the bunkering delivery receipt issuance device, the information received from the oil company server on a screen of a first application;

displaying, by the bunkering delivery receipt issuance device, on the screen of the first application, a start time at which the fuel-feeding vessel supplies the oil fuel to the fuel-receiving vessel, and a termination time of the supply of the oil fuel to the fuel-receiving vessel;

receiving, by the bunkering delivery receipt issuance device, through a second application, a signature related to the fuel supply from each of a mobile terminal of a manager

of an oil company, a mobile terminal of a manager of the fuel-feeding vessel, and a mobile terminal of a manager of the fuel-receiving vessel;

generating, by the bunkering delivery receipt issuance device, a bunkering delivery receipt related to the fuel supply to the fuel-receiving vessel, based on the received signatures; and

automatically transmitting, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt to at least one designated email,

wherein generating, by the bunkering delivery receipt issuance device, the bunkering delivery receipt comprises identifying whether the signature is entered through the second application by synchronization between the first application and the second application, and

wherein automatically transmitting, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt comprises:

storing the generated bunkering delivery receipt in a memory of the bunkering delivery receipt issuance device when the bunkering delivery receipt issuance device is not located in a wireless communication service area while fueling the fuel-receiving vessel at sea; and

automatically transmitting the stored bunkering delivery receipt to the at least one designated email through the first application when the bunkering delivery receipt issuance device is located in the wireless communication service area.

8. The method of claim 7, wherein displaying, by the bunkering delivery receipt issuance device, on the screen, the start time and the termination time includes receiving, by the bunkering delivery receipt issuance device, the start time and the termination time from at least one sensor attached to an oil supply pipe through which the oil fuel is delivered from the fuel-feeding vessel to the fuel-receiving vessel.

9. The method of claim 7, wherein generating, by the bunkering delivery receipt issuance device, the bunkering delivery receipt includes:

calculating, by the bunkering delivery receipt issuance device, a total supplied oil amount supplied for a time duration from the start time to the termination time;

comparing, by the bunkering delivery receipt issuance device, the calculated total supplied oil amount with an average oil amount as expected to be supplied for the time duration; and

determining, by the bunkering delivery receipt issuance device, based on the comparing result, whether a difference between the calculated total supplied oil amount and the average oil amount falls within a predefined range.

10. The method of claim 9, wherein determining, by the bunkering delivery receipt issuance device, based on the comparing result, whether the difference between the calculated total supplied oil amount and the average oil amount falls within the predefined range includes notifying, by the bunkering delivery receipt issuance device, an alarm through the application when the difference between the calculated total supplied oil amount and the average oil amount does not fall within the predefined range.

11. The method of claim 7, wherein automatically transmitting, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt to the at least one designated email includes automatically transmitting, by the bunkering delivery receipt issuance device, the stored bunkering delivery receipt to the at least one email when the device is located in the wireless communication service area.

12. A bunkering delivery receipt issuance device based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea, the device comprising:

a communication unit;

a display;

a processor electrically connected to the communication unit and the display; and

a memory electrically connected to the processor,

wherein the memory stores therein instructions,

wherein when the instructions are executed by the processor, the instructions cause the processor to:

receive information about supplying of oil fuel to at least one fuel-receiving vessel from an oil company server via the communication unit;

display the information received from the oil company server on a screen of a first application on the display;

display, on the screen of the first application, a start time at which the fuel-feeding vessel supplies the oil fuel to the fuel-receiving vessel, and a termination time of the supply of the oil fuel to the fuel-receiving vessel;

receive, through a second application, a signature related to the fuel supply from each of a mobile terminal of a manager of an oil company, a mobile terminal of a manager of the fuel-feeding vessel, and a mobile terminal of a manager of the fuel-receiving vessel;

generate a bunkering delivery receipt related to the fuel supply to the fuel-receiving vessel, based on the received signatures; and

automatically transmit the generated bunkering delivery receipt to at least one designated email via the communication unit,

wherein the bunkering delivery receipt issuance device is further configured to:

identify whether the signature is entered through the second application by synchronization between the first application and the second application,

store the generated bunkering delivery receipt in a memory of the bunkering delivery receipt issuance device when the bunkering delivery receipt issuance device is not

located in a wireless communication service area while fueling the fuel-receiving vessel at sea, and

automatically transmit the stored bunkering delivery receipt to the at least one designated email through the first application when the bunkering delivery receipt issuance device is located in the wireless communication service area.

13. The device of claim 12, wherein when the instructions are executed by the processor, the instructions cause the processor to receive the start time and the termination time from at least one sensor attached to an oil supply pipe through which the oil fuel is delivered from the fuel-feeding vessel to the fuel-receiving vessel.

14. The device of claim 13, wherein when the instructions are executed by the processor, the instructions cause the processor to:

calculate a total supplied oil amount supplied for a time duration from the start time to the termination time;

compare the calculated total supplied oil amount with an average oil amount as expected to be supplied for the time duration; and

determine, based on the comparing result, whether a difference between the calculated total supplied oil amount and the average oil amount falls within a predefined range.

15. The device of claim 14, wherein when the instructions are executed by the processor, the instructions cause the processor to notify an alarm through the application when the difference between the calculated total supplied oil amount and the average oil amount does not fall within the predefined range.

16. The device of claim 12, wherein when the instructions are executed by the processor, the instructions cause the processor to automatically transmit the stored bunkering delivery receipt to the at least one email when the device is located in the wireless communication service area.

17. A bunkering delivery receipt issuance method performed by a bunkering delivery receipt issuance device based on a scheme in which a fuel-feeding vessel supplies oil fuel to a fuel-receiving vessel on the sea, the method comprising:

receiving, by the bunkering delivery receipt issuance device, information about supplying of the oil fuel to at least one fuel-receiving vessel from the oil company server;

displaying, by the bunkering delivery receipt issuance device, the information received from the oil company server on a screen of a first application;

displaying, by the bunkering delivery receipt issuance device, on the screen of the first application, a start time at which the fuel-feeding vessel supplies the oil fuel to the fuel-receiving vessel, and a termination time of the supply of the oil fuel to the fuel-receiving vessel;

receiving, by the bunkering delivery receipt issuance device, through a second application, a signature related to the fuel supply from each of a mobile terminal of a manager of an oil company, a mobile terminal of a manager of the fuel-feeding vessel, and a mobile terminal of a manager of the fuel-receiving vessel;

generating, by the bunkering delivery receipt issuance device, a bunkering delivery receipt related to the fuel supply to the fuel-receiving vessel, based on the received signatures; and

automatically transmitting, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt to at least one designated email,

wherein generating, by the bunkering delivery receipt issuance device, the bunkering delivery receipt comprises identifying whether the signature is entered through the second application by synchronization between the first application and the second application, and

wherein automatically transmitting, by the bunkering delivery receipt issuance device, the generated bunkering delivery receipt comprises:

storing the generator bunkering delivery receipt in a memory of the bunkering delivery receipt issuance device when the bunkering delivery receipt issuance device is not located in a wireless communication service area while fueling the fuel-receiving vessel at sea; and

automatically transmitting the stored bunkering delivery receipt to the at least one designated email through the first application when the bunkering delivery receipt issuance device is located in the wireless communication service area.