

CONTAINER SKID TYPE FIRE EXTINGUISHING SYSTEM AND MANUFACTURING METHOD THEREOF

CROSS-REFERENCE TO RELATED APPLICATION

5 **[0001]** This application claims priority from Korean Patent Application No. 10-2017-0136688, filed on October 20, 2017 in the Korean Intellectual Property Office (KIPO), the disclosures of which are hereby incorporated by reference in their entirety.

BACKGROUND

10 1. Technical Field

[0002] The present disclosure relates to a container skid type fire extinguishing system and a manufacturing method thereof, and more particularly the container skid type fire extinguishing system and the manufacturing method of thereof capable of easily transporting the inside and outside of the ship, by efficiently manufacturing the fire extinguishing
15 equipment of the ship so as to be positively positioned relative to the container skid

2. Discussion of the Related Art

[0003] In general, the ship is equipped with a storage container of heavy fuel oil /oil, a heater of heavy fuel oil/ lubricating oil, a steam boiler /economizer for heating, a thermal oil boiler/economizer, and an electric boiler for supplying heat source. In order to supply heat
20 source, the steam boiler / economizer may be installed on the ship. Recently offshore ship or special purpose ship are exposed to low temperature condition such as Arctic and Antarctic.

Therefore, it is a tendency to install the thermal oil boiler and the Economizer to prevent the freezing and to establish a semi-permanent heat source system.

[0004] However, in the case of the thermal oil boiler and the Economizer, during an internal fire, the exposed oil due to the breakage of the thermal oil pipe may lead to a bigger fire. On the other hand, a water injection fire extinguishing system using fresh water was used to extinguish the internal fire caused by the thermal oil boiler/economizer used in conventional ship. However, a cooling method such as the water injection fire extinguishing system has a risk of breakage the pipe of the thermal oil boiler overheated by the fire, due to rapid cooling. Hence, the water injection fire extinguishing system may not be suitable as fire extinguishing method because it may be transferred to oil fire. In addition, the injected fire extinguishing water may enter into an engine through a vent pipe, and it cause damage to the engine.

[0005] Accordingly, recently, there has been a tendency that the fire extinguishing system in which a fire extinguishing agent such as carbon dioxide is used as a fire extinguishing source so as to block the supply of oxygen is applied to the ship. It is required to study a method that such the fire extinguishing system using carbon dioxide may quickly perform a fire extinguishing operation in case of the fire in the ship.

[0006] The present disclosure relates to the container skid type fire extinguishing system and the manufacturing method thereof capable of easily transporting the inside and outside of the ship and increasing the efficiency by assembling the fire extinguishing system in a correct posture inside the container skid.

SUMMARY

[0007] To solve the above problems and defects, it is an object of the present disclosure to provide a container skid type fire extinguishing system that includes a plurality of container skids having an internal space; a plurality of storage containers, each of which are packaged and installed independently to the plurality of skids, and in which a fire extinguishing agent is stored; and a control device installed on at least a part of the plurality of container skids so as to be connected to the plurality of storage containers for controlling of a fire extinguishing operation.

[0008] In an embodiment of the present disclosure, the plurality of container skids may be an International Standardization Organization (ISO) container, conforming to an international standard to be shipped to a ship, and may be painted for preventing of corrosion.

[0009] In an embodiment of the present disclosure, the fire extinguishing agent released from the plurality of storage containers may be discharged to a protection zone connected to a main pipe, which is a passage of the fire extinguishing agent provided in each of the plurality of container skids through a manifold.

[0010] In an embodiment of the present disclosure, the plurality of storage containers may be connected to the manifold via a hose provided at an upper portion thereof, and the main pipe may be installed at an upper portion of the plurality of container skids.

[0011] In an embodiment of the present disclosure, the plurality of storage containers may be assembled to in at least one of the plurality of container skids, and the plurality of storage containers and the control devices may be assembled adjacent to each other in another one of the plurality of container skids, and the plurality of container skids may be

mutually connected so that the plurality of storage containers individually packaged to the plurality of container skids share the control devices to control them together.

[0012] In an embodiment of the present disclosure, a guider may be further provided in close contact with an outer surface of the plurality of storage containers and disposed
5 between the plurality of storage containers to support a posture of the storage containers so that the plurality of storage containers does not flow. The guider may include a first guider extending integrally from the container skid and a second guider positioned between the plurality of storage containers and formed of a shock absorbing material capable of absorbing external force.

10 **[0013]** In an embodiment of the present disclosure, the plurality of storage containers may be interposed between guiders and packaged in multiple rows and lines. The plurality of storage containers may be bolted by a bolt which is connected to the container skid by extending pass through the guider.

[0014] In an embodiment of the present disclosure, a weight measuring member may be
15 further provided to measure weights of the plurality of storage containers upper portion of the container skid.

[0015] In an embodiment of the present disclosure, the control device may include at least one of a smoke detection panel, a control valve cabinet in which a control valve is installed, an extension panel, an instruction manual, a release control cabinet, a main
20 emergency power supply switch, a main valve, a fan motor unit skid, a time delay unit, a fire detection panel synchrony-assembly, a junction box, a smoke detection relay box, a fire extinguishing agent alarm relay box, a pressure switch, and a pressure gauge. The control

device may be installed adjacent to the plurality of storage containers inside the container skid.

[0016] In an embodiment of the present disclosure, the control device may include the pressure switch provided between the plurality of storage containers, the fire extinguishing agent alarm relay box provided adjacent to the plurality of storage containers, and a pressure gauge provided to face a fire extinguishing agent alarm relay box.

[0017] In an embodiment of the present disclosure, the control device may further include a plurality of control valve cabinets provided along inner wall of the container skid, a smoke detection panel provided at a position to face the pressure gauge, and a plurality of extension panels provided on both sides of the smoke detection panel to be connected to the smoke detection panel.

[0018] In an embodiment of the present disclosure, the control device may further include a release control cabinet, a main emergency power supply switch, a main valve and a fan motor unit skid, which are adjacent to the smoke detection panel. The main emergency power supply switch may be installed on the side of the container skid and exposed to the outside.

[0019] In an embodiment of the present disclosure, the control device may further include a time delay unit, a fire alarm panel synchrony assembly, a junction box, and a smoke detection relay box. In addition, the control valve cabinet, the main emergency power supply switch, the time delay unit, the fire detection panel synchrony-assembly, and the junction box. The smoke detection relay box may be provided on opposite side of the plurality of storage containers with the release control cabinet there-between.

[0020] In an embodiment of the present disclosure, the fire extinguishing agent may be carbon dioxide.

[0021] To solve the above problems and defects, it is an object of the present disclosure to provide a method of manufacturing a container skid type fire extinguishing system that includes for assembling a plurality of packaged storage containers in which a fire extinguishing agent is stored in a plurality of container skids having an internal space; for assembling a control device for controlling the plurality of storage containers in at least one of the plurality of container skids; and for preparing a packaging and releasing by interconnecting the plurality of container skids.

[0022] In an embodiment of the present disclosure, the plurality of container skids may be an International Organization Standardization (ISO) container conforming to international standard to be shipped to the ship, and may be painted for preventing of corrosion.

[0023] In an embodiment of the present disclosure, the storage container assembling step may include for preparing the plurality of container skids, for preparing a plurality of the storage containers and packaging them with each other; and for assembling the packaged plurality of storage containers to the plurality of container skids.

[0024] In an embodiment of the present disclosure, wherein the plurality of storage containers may be assembled in at least one of the plurality of container skids. The plurality of storage containers and the control devices may be assembled adjacent to each other in another one of the plurality of container skids.

[0025] In an embodiment of the present disclosure, the storing container assembling step may include for mounting a main pipe which is a passage of the fire extinguishing agent, to

one side of the plurality of container skids, and for connecting the packaged plurality of storage containers with the main pipe through the manifold.

[0026] In an embodiment of the present disclosure, the storage container assembling step may include for packaging the plurality of storage containers in a state in which a guider
5 provided in close contact with an outer surface of the plurality of storage containers is disposed between the plurality of storage containers, and for supporting a posture of the packaged plurality of storage container to the container skid so that the plurality of storage containers do not flow.

[0027] In an embodiment of the present disclosure, the guider may include a first guider
10 extending integrally from the container skid and a second guider positioned between the plurality of storage containers and formed of a shock absorbing material capable of absorbing external force.

[0028] In an embodiment of the present disclosure, the storage container assembling step may include for connecting the plurality of storage containers with a weight measuring
15 member to measure weights of the plurality of storage containers assembled in the container skid.

[0029] In an embodiment of the present disclosure, the control device assembling step may include for installing the control device inside the container skid so as to be adjacent to the plurality of storage containers. The control device may include at least one of a smoke
20 detection panel, a control valve cabinet in which a control valve is installed, an extension panel, an instruction manual, a release control cabinet, a main emergency power supply switch, main valve, a fan motor unit skid, a time delay unit, a fire detection panel synchrony-

assembly, a junction box, a smoke detection relay box, a fire extinguishing agent alarm relay box, and a pressure switch, and a pressure gauge.

[0030] In an embodiment of the present disclosure, the preparing the packaging and releasing step may include for connecting the control device to the plurality of storage
5 containers so that control device assembled to at least one of the plurality of container skids may control the plurality of storage containers assembled in the plurality of container skids.

[0031] According to the present disclosure having the above-described configuration, the first, the fire extinguishing system may be assembled in the correct posture by using the container skid which is capable of easily transporting the inside and outside of the ship,
10 thereby contributing to the improvement of installation efficiency of the fire extinguishing system.

[0032] The second, the assembly process of the fire extinguishing system can be segmented and standardized, and the manufacturing efficiency can be improved.

[0033] The third, it can provide the fire extinguishing system capable of confirming to
15 various ship standards by easily separating and connecting the plurality of container skids.

[0034] The fourth, some of the plurality of containers can be controlled by assembling only the storage container and interworking with the control device provided in the remaining part.

[0035] The Fifth, the performance test and verification before shipment may be
20 completed by packaging and modularizing all the components of the fire extinguishing system. It is possible to shorten the ship drying process by shortening the performance test / verification time on the ship, thereby improving the ship manufacturing efficiency.

BRIEF DESCRIPTION OF THE DRAWINGS

[0036] FIG. 1 is a flowchart schematically showing a method of manufacturing a container skid type fire extinguishing system according to a preferred exemplary embodiment of the present disclosure.

[0037] FIG. 2 is a perspective view schematically showing a module structure of the container skid type fire extinguishing system according to a preferred exemplary embodiment of the present disclosure.

[0038] FIG. 3 is a plain view schematically showing the module structure of the container skid type fire extinguishing system shown in FIG. 2.

[0039] FIG. 4A is a left side view schematically showing the module structure of the container skid type fire extinguishing system shown in FIG. 2.

[0040] FIG. 4B is a front view schematically showing the module structure of the container skid type fire extinguishing system shown in FIG. 2.

[0041] FIG. 4C is a right side view schematically showing the module structure of the container skid type fire extinguishing system shown in FIG. 2

[0042] FIG. 5 is a sectional view schematically showing a state in which the V region of FIG. 3 is enlarged and cut.

[0043] FIG. 6 is a sectional view schematically showing a state of being cut along the line VI-VI of FIG. 4A.

[0044] FIG. 7 is a sectional view schematically showing a state of being cut along the line VII-VII of FIG. 4B.

[0045] FIG. 8 is a cross-sectional view schematically showing a state of being cut along the line VIII-VIII of FIG. 4B.

[0046] FIG. 9 is a perspective view schematically showing a storage container assembly state of the container skid type fire extinguishing system according to another embodiment of the present disclosure.

[0047] FIG. 10 is a plan view schematically showing the storage container assembling arrangement of the container skid type fire extinguishing system shown in FIG. 9.

[0048] FIGS. 11 is a left side view and a front view schematically showing the storage container assembling arrangement of the container skid type fire extinguishing system shown in FIG. 9.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0049] Hereinafter, exemplary embodiments of the present disclosure will be described in detail with reference to the accompanying drawings, which will be readily apparent to those skilled in the art to which the present disclosure pertains. The present disclosure may be embodied in many different forms and is not limited to the embodiments described herein. In the drawings, parts not relating to the description are omitted for clarifying the present disclosure, and the same reference numerals are assigned to the same or similar components throughout the specification.

[0050] FIG. 1 shows a specific procedure of a method of manufacturing a container skid type fire extinguishing system according to a preferred exemplary embodiment of the present disclosure

[0051] As shown in FIG. 1, the method of manufacturing the container skid type fire extinguishing system 100 according to a preferred exemplary embodiment of the present disclosure may include a preparation step 1, a storage container assembling step 2, a fire extinguishing pipe assembling step 3, a main components assembling step 4, a control device assembling step 5, a performance test / verification step 6, and a packaging / releasing preparation step 7.

[0052] For reference, as shown in FIG. 2, the manufacturing method of the container skid type fire extinguishing system 100 according to the present disclosure may be to manufacture the container skid type fire extinguishing system 100 capable of extinguishing fire by supplying fire extinguishing agent when fire occurs in the ship.

[0053] The preparation step 1 may include for preparing parts necessary to manufacture the container skid type fire extinguishing system 100. To this end, the preparation step 1 may include a producing step 1a of a high-pressure storage container 20, a preparing step 1b of a container skid 10, a preparing step 1c of a fire extinguishing part and a preparing step 1d of main parts. Each of these steps 1a to 1d may be performed concurrently, sequentially, or both.

[0054] Here, the preparing step 1a of the high pressure storage container 20 may be for preparing the storage container 20, which is a key component in the manufacture of the container skid type fire extinguishing system 100. The storage container may have a plurality of specific capacities, such as a volume of 68 liters or 80 liters depending on the storage size of the fire extinguishing system 100. At this time, the capacity of the storage container 20 may be not limited to the above example and variable.

[0055] The preparation step 1b of the container skid 10 may be for preparing the container skid 10 which is a basic structure in which the storage container 20 is mounted in manufacturing of the container skid type fire extinguishing system 100. Such the container skid 10 may be purchased by a special manufacturer, or may be prepared by self-production.

5 **[0056]** The preparing step 1c of the fire extinguishing parts may be for preparing a part or a plurality of parts constituting the container skid type fire extinguishing system 100, and each part may be manufactured according to a prescribed manufacturing standard.

[0057] The preparing step of 1d of the main part may be to provide the main core parts of the container skid type fire extinguishing system 100. As shown in FIG. 2, the main core
10 parts of the container skid type fire extinguishing system 100 may be a main valve 37 for controlling a discharging of the fire extinguishing agent when the fire occurs in the ship, a main pipe 11 for transporting the fire extinguish agent to the protection area and a container valve for opening the fire extinguishing agent stored in the storage container 20 to be sent to the manifold 13 (refer to FIG. 10) and the main pipe 11 through a flexible hose of high
15 pressure.

[0058] In the storage container assembling step 2, as shown in FIG. 2, the storage container 20 storing the fire extinguishing agent may be packaged and assembled inside the container skid 10 having an internal space. In FIG. 2, even only one container skid 10 may be provided, the plurality of the container skids 10 may be provided in the same standard.

20 **[0059]** The storage container assembling step 2 may assemble the storage container 20 to the plurality of container skids 10 after preparing the plurality of container skids 10 and the

storage container 20. Here, the plurality of storage containers 20 may be assembled in the container skid 10 in a packaged state.

[0060] The container skid 10 may be the International Organization Standardization (ISO) container conforming to international standard that can be shipped to the ship, and FIG. 2 may illustrate that the container skid 10 may have a size of 20 feet (ft). In addition, the plurality of container skids 10 may be formed of printed steel material to prevent corrosion.

[0061] Meanwhile, although not shown in detail, the plurality of storage containers 20 may be packaged and assembled in the entire inner area of the container skid 10. As shown in FIG. 2, the plurality of storage containers 20 may be assembled inside the container skid 10 together with the control device 30 to be described later, or only the plurality of the storage containers 20 may be assembled. In an exemplary embodiment, the plurality of container skids 10 may be provided. Here, at least one of the plurality of container skids 10 may be assembled with only the storage containers 20, and another one of the container skids 10 may be assembled together with storage containers 20 and the control device 30.

[0062] In an exemplary embodiment, the storage container 20 may store carbon dioxide, which is a fire extinguishing agent therein. The storage container 20 may have, for example, a capacity capable of storing approximately 55 kg of carbon dioxide, but is not limited thereto. This storage container 20 may be ready to be tested in performance before being assembled to the container skid 10. The packaged storage containers 20 may be placed in the container skid 10 by means of transportation such as a crane (not shown) and fastened to the interior of the container skid 10 by fastening means. The packaged storage containers 20 may be fastened to the container skid 10 by, for example, a bolt connection described below.

[0063] As shown in FIG. 5, the plurality of storage containers 20 may be packaged in multi-rows and multi-lines each other. According to an exemplary embodiment, a plurality of storage containers 20 may be arranged in the form of a matrix of, for example, NxM (where N and M are natural numbers of 2 or more). A guider 23 may be disposed between the plurality of storage containers 20. The guider 23 may be formed to be in close contact with the outer surface of the storage container 20. According to the exemplary embodiment, the guider 23 may be provided with a plurality of curved surface portions which can be in close contact with a curved section of the cylindrical outer surface of the plurality of storage containers 20. That is, the guider 23 may be interposed between the plurality of storage containers 20, and may hold the storage container 20 so that it does not flow to maintain a stable posture.

[0064] The guider 23 may include a first guider 23a integrally extending from the container skid 10 along the inner wall of the transverse direction and a second guider 23b disposed in parallel with the first guider 23a between the rows and the rows of the plurality of storage containers 20 arranged in a matrix form. According to an exemplary embodiment, the first guider 23a may be formed of the same solid material as the container skid 10, and the second guider 23b can be made of an elastic material such as rubber or urethane, that is, a shock absorbing material to buffer the external force applied to the storage container 20. However, the material of the guider 23 is not limited thereto. For example, the first guider 23a may be formed of an elastic material, and the second guider 23b may be formed of a solid material.

[0065] For reference, the guider 23 including the first and second guiders 23a and 23b may be variously modified to a triangle or a quadrangle as shown in FIG. 5 depending on the presence or absence of the neighboring storage container 20.

[0066] As shown in FIG. 5, the packaged storage containers 20 may be fastened to the container skid 10 using bolts-nuts. In FIG. 5, when a plurality of guiders 23 are arranged transversely between the rows and the rows of the storage containers 20. According to an exemplary embodiment, the bolts B may pass through the transverse portions of the plurality of guiders 23 and the container skids 10 in the longitudinal direction and the ends of the bolts B protruded outward may be filled with the nuts N. The plurality of bolts B may extend through the guider 23 and may be bolted to the container skid 10 in this manner so that the plurality of storage containers 20 may be fixed to the container skid 10 in a rigid posture.

[0067] When the storage container 20 is assembled in the container skid 10, as shown in FIG. 3, the main pipe 11 which is a moving passage for moving the fire extinguishing agent of the container skid 10, and the plurality of storage containers 20 may be connected through the hose 21. Here, the hose 21 may be connected to the upper portion of the plurality of storage containers 20, and the main pipe 11 may be located on the upper portion of the container skid 10 as shown in FIGS. 3 and 4A. The main pipe 11 may be connected to the hoses 21 of the plurality of storage containers 20 by the auxiliary pipe 12 and the manifold 13 so that carbon dioxide which is the fire extinguishing agent can be discharged to the outside.

[0068] Here, the main pipe 11 and the auxiliary pipe 12 may be fixed in position by using a U-shaped fixing bolt (not shown) or the like upper side of the container skid 10, but may be not limited thereto.

[0069] Further, in order to confirm the volume of the fire extinguishing agent stored in the plurality of storage containers 20, the plurality of storage containers 20 may be connected to the weight measuring member 22. The weight measuring member 22 may be arranged in parallel with the auxiliary pipe 12 on the top of the container skid 10 as shown in FIG. 2. The weight of the storage container 20 may be measured by latching the specific weight measuring member 22 by operating the valve engagement portion of the storage container 20. As shown in FIG. 2 and 3, the weight measuring member 22 may be provided to correspond to each row of a plurality of storage containers 20 packaged in multi-rows and multi-lines in parallel.

[0070] The fire extinguishing pipe assembling step 3 may be assembled to the plurality of container skids 10 and each manifold 13 for transferring the gas of storage container 20 to the main pipe 11 may be installed on the upper portion of the storage container and connected to the flexible hose. The main pipe 11 installed on the upper portion of the manifold 13 may be connected to the plurality of manifolds 13.

[0071] In the main components assembling step 4, a main valve (refer to FIG. 7) for controlling the discharging of the fire extinguishing agent reaching the container valve (not shown) and the main pipe for transporting the fire extinguishing agent stored in the storage container 20 to the manifold 13 and the main pipe 11 through the hose 21 may be mounted to

a part, as shown in FIG 2. The container valve may be mounted to the storage container 10 in the producing step 1a of the storage container 10.

[0072] In the control device assembling step 5, the control device 30 for controlling the storage containers 20 may be assembled to at least one of the plurality of container skids 10.

5 This control device 30 may be to control the extinguishing operation and may be assembled only in a part of the plurality of container skids 10. As shown in FIG. 2 and 3, on one side of container skid 10, the storage container 20 may be packaged and assembled, and on the other side of container skid 10, the control devices 30 may be assembled and connected to the storage container 20.

10 **[0073]** As shown in FIG. 6, the control device 30 may be provided to connect a smoke detection panel 31 for detecting the occurrence of fire, a control valve cabinet 32 in which the control valve is installed, and an extension panel 33 on the other side of the container skid 10. As shown in FIG. 7, the control device 30 may include at least one of a release control cabinet 35, a main emergency power supply switch 36, a main valve 37, a fan motor unit skid 36 for discharging the detected smoke to the outside air, a time delay unit 39, a fire
15 detection panel synchrony assembly 40, a junction box 41 and smoke detection relay box 42, and may be assembled to the other side of the container skid 10. The control device 30 may also include an instruction manual 34. The control device 30 may include a carbon dioxide alarm relay box 43, a pressure switch 44, and a pressure gauge 45. These control devices 30
20 may be not limited to the illustrated examples.

[0074] According to an exemplary embodiment, as shown in FIGS. 4A to 4C, the plurality of storage containers 20 may be assembled the packaged plurality of container

storage 20 on one side of the container skid 10, and arranged to the carbon dioxide alarm relay box 43 adjacent to the plurality of storage containers 20. The pressure gauge 45 may be arranged to face the carbon dioxide alarm relay box 43 side by side. The pressure switch 44 may be provided between the plurality of storage containers 20 to sense the pressure of the storage container 20 and to check whether the system operates and whether the extinguishing agent such as carbon dioxide gas leaks.

[0075] As shown in FIG. 6, the plurality of control valve cabinets 32 may be arranged along the inner wall of the container skid 10. The smoke detection panel 31 may be provided at a position facing the pressure gauge 45. The plurality of extension panels 33 may be provided on both sides of the smoke detection panel 31 and may be connected to the smoke detection panel 31.

[0076] As shown in FIG. 7, the instruction manual 34, the release control cabinet 35, and the main emergency power supply switch 36, the main valve 37 and the fan motor unit skid 38 may be provided at the other side of the container skid 10, that is, adjacent to the smoke detection panel 31. At this time, the main emergency power supply switch 36 may be installed on the side of the container skid 10 and exposed to the outside, so that it can be operated by the operator.

[0077] As shown in FIG. 8, the control valve cabinet 32, the main emergency power supply switch 36, the time delay unit 39, and the fire detection panel synchro assembly 40, the junction box 41 and the smoke detection relay box 42 may be provided on the opposite side of the storage container 20 with the release control cabinet 35 interposed there between.

[0078] As shown in FIG 8, the control device 30 as described above may be packaged and assembled in the container skid 10 adjacent to the storage container 20 and connected for control of the fire extinguishment of the storage container 20. At this time, the control device 30 may be connected to the storage container 20 assembled with another container skid 10 to which the control device 30 is not assembled.

[0079] The configuration and arrangement positions of the control devices 30 are not limited to the illustrated examples, and the configuration and arrangement thereof may be changed as necessary.

[0080] When the storage container 20 and the control device 30 are assembled to the container skid 10 as described above steps of 1 to 5, the plurality of container skids 10 may be interconnected and perform the performance test/verification step 6.

[0081] The performance test/ verification step 6 may verify whether the operation of the fire extinguishing system 100 at the time of fire occurrence on the ship is quick and smooth. Therefore, the completeness of the performance of the system 100 may be demonstrated.

[0082] To this end, the release control cabinet 35 may open and a small starter container mounted inside the release control cabinet 35 may operate. As the small starter container is operated, the starting gas in the small starter container may open the container valve (not shown) of the storage container 20 and the main valve 37 may be automatically opened. Whether the main valve 37 is automatically opened or not may be recognized by an automatic rotation of a handle of the main valve 37.

[0083] The fire extinguishing agent discharged from the storage container 20 simultaneously with the opening of the main valve 37 may pass through the flexible hose 21,

the manifold 13, the main pipe 11 and the main valve 37, and discharge through a pipe discharging portion (Not shown). In the performance test in the ship, the pipe (not shown) having a predetermined size and length may be provided at a rear end of the main valve 37, and a releasing nozzle (not shown) may be attached to the end of the pipe to discharge the fire extinguishing agent to the atmosphere during the performance test.

[0084] In packaging and releasing preparation step 7, the plurality of container skids 10 may be interconnected. For example, the container skid 10 in which the storage container 20 is assembled, and the container skid 10 in which the storage container 20 and the control device 30 are assembled together, may be connected to control together. Therefore, the plurality of container skids 10 may share one control device 30 and control the fire extinguishing operation of the plurality of container skids 10 via the one control device 30.

[0085] The plurality of container skids 10 for shipment may be installed to the interior of the ship in the minimized installation area. That is, an individual container skid may not be required in the ship for installing the fire extinguishing system 100, and the whole fire extinguishing system 100 packaged in the container skid 10 may be transported to the ship by the transportation means such as a crane (not shown). Therefore, the container skid type fire extinguishing system 100 according to the present disclosure may be easy to transport, and the shipping for ISO container may be easily performed, thereby reducing the cost of logistics and packaging.

[0086] On the other hand, the container skid 10 described in the present embodiment is illustrated as 20 feet (ft) in size, but is not limited thereto. That is, the container skid 10 may be variously standardized according to conditions such as the size of the ship or the fire

extinguishing system 100, so that various devices of the fire extinguishing system 100 may be assembled and manufactured as a packaging unit.

[0087] FIGS 9 to 11 may illustrate a container skid type fire extinguishing system 200 according to another embodiment of the present disclosure. A container skid type fire extinguishing system 200 according to another embodiment may include a plurality of storage containers 220 packaged and assembled in a container skid 210 having a size of 30 feet as shown in FIGS. 9 to 11.

[0088] As shown in FIGS. 9 to 11, the container skid 210 according to another embodiment may correspond to the ISO container standard, and be painted for preventing corrosion. In addition, a plurality of storage containers 220 may be packaged and assembled together. An auxiliary pipe 212 and a manifold 213 connected to a main pipe 211 may be provided and connected to the storage container 220 through the hose 221.

[0089] As shown in FIG. 9, the guider 223 may be provided between the plurality of storage containers 220 to prevent from flowing. As shown in FIG. 10, the amount of fire extinguishing agent in the storage container 220 installed in the container skid 210 may be measured by the weight measuring member 222.

[0090] Although not shown in detail, a plurality of container skids 210 according to another embodiment may be provided as described above. At least one of the plurality of container skids 210 may be assembled with the storage container 220 as shown in FIGS. 9 to 1, and another one of the container skids 210 may be assembled together with the control device 30 as shown in FIG. 2. When the storage container 220 and the control device 30 are assembled to the plurality of container skids 210, the performance test / verification step 6

described above may be performed. Thereby, the container skid type fire extinguishing system 200 according to another embodiment may be verified by testing the performance.

[0091] The plurality of container skids 210 may be commissioned to be interconnected and ready for shipment. The plurality of container skids 210 for shipment may be transported
5 to the inside and outside of the ship.

[0092] Meanwhile, although not shown in detail, the number of connection of the container skids 10 and 210 according to the above-described embodiment and other embodiments may be flexibly adjusted according to the size of the ship and the capacity of the fire extinguishing system 100. In addition, even if the ship equipped with the container
10 skid type fire extinguishing system 100 according to the present disclosure is shut down, the container skids 10 and 210 may be separated from the ship and moved to a new ship. The number of connected container skids 10 and 210 may be adjusted according to various ship conditions

[0093] As described above, the present disclosure has been described with respect to
15 particularly preferred embodiments. However, the present disclosure is not limited to the above embodiments, and it is possible for one who has an ordinary skill in the art to make various modifications and variations, without departing off the spirit of the present disclosure.

WHAT IS CLAIMED IS:

1. A container skid type fire extinguishing system comprising:
a plurality of container skids having an internal space;
5 a plurality of storage containers, each of which are packaged and installed independently in the plurality of container skids, and in which a fire extinguishing agent is stored; and
a control device installed on at least a part of the plurality of container skids so as to be connected to the plurality of storage containers for controlling of a fire extinguishing operation.
- 10 2. The container skid type fire extinguishing system of claim 1, wherein the plurality of container skids is an International Standardization Organization (ISO) container, conforming to an international standard to be shipped to a ship, and is painted for preventing of corrosion.
3. The container skid type fire extinguishing system of claim 1, wherein the fire
15 extinguishing agent released from the plurality of storage containers is discharged to a protection zone connected to a main pipe, which is a passage of the fire extinguishing agent provided in each of the plurality of container skids through a manifold.
4. The container skid type fire extinguishing system of claim 3, wherein the plurality of
20 storage containers is connected to the manifold via a hose provided at an upper portion thereof, and the main pipe is installed upper portion of the plurality of container skids.

5. The container skid type fire extinguishing system of claim 1, wherein the plurality of storage containers is assembled to a whole area in at least one of the plurality of container skids, and the plurality of storage containers and the control devices are assembled adjacent to each other to in another one of the plurality of container skids, and wherein the plurality of container skids is mutually connected so that the plurality of storage containers individually packaged to the plurality of container skids shares the control devices to control them together.

6. The container skid type fire extinguishing system of claim 1, further comprising a guider provided in close contact with an outer surface of the plurality of storage containers and disposed between the plurality of storage containers to support a posture of the storage containers so that the plurality of storage containers does not flow, and wherein the guider includes a first guider extending integrally from the container skid and a second guider disposed between the plurality of storage containers and formed of a shock absorbing material capable of absorbing external force.

7. The container skid type fire extinguishing system of claim 6, wherein the plurality of storage containers is interposed between guiders and packaged in multiple rows and lines and is bolted by a bolt which is connected to the container skid by extending pass through the guider.

8. The container skid type fire extinguishing system of claim 1, further comprising a weight measuring member to measure weights of the plurality of storage containers upper portion of the container skid.

9. The container skid type fire extinguishing system of claim 1, wherein the control device includes at least one of a smoke detection panel, a control valve cabinet in which a control valve is installed, an extension panel, an instruction manual, a release control cabinet, a main emergency power supply switch, a main valve, a fan motor unit skid, a time delay unit, a fire
5 detection panel synchrony assembly, a junction box, a smoke detection relay box, a fire extinguishing agent alarm relay box, a pressure switch, and a pressure gauge, and wherein the control device is installed adjacent to the plurality of storage containers inside the container skid.

10. The container skid type fire extinguishing system of claim 1, wherein the control device
10 is installed adjacent to the plurality of storage containers inside the container skid, and wherein the control device includes a pressure switch provided between the plurality of storage containers, a fire extinguishing agent alarm relay box provided adjacent to the plurality of storage containers, and the pressure gauge provided to face the fire extinguishing agent alarm relay box.

15 11. The container skid type fire extinguishing system of claim 10, wherein the control device further includes a plurality of control valve cabinets provided along inner wall of the container skid, a smoke detection panel provided to face the pressure gauge, and a plurality of extension panels provided on both sides of the smoke detection panel to be connected to the smoke detection panel.

20 12. The container skid type fire extinguishing system of claim 11, wherein the control device further includes a release control cabinet, a main emergency power supply switch, a main

valve and a fan motor unit skid, which are adjacent to the smoke detection panel, and wherein the main emergency power supply switch is installed on the side of the container skid and exposed to the outside.

5 13. The container skid type fire extinguishing system of claim 12, wherein the control device further includes a time delay unit, a fire alarm panel synchrony assembly, a junction box, and a smoke detection relay box, and wherein the control valve cabinet, the main emergency power supply switch, the time delay unit, the fire detection panel synchro assembly, the junction box, and the smoke detection relay box are provided on opposite side of the plurality of storage
10 containers with the release control cabinet there-between.

14. The container skid type fire extinguishing system of claim 1 to 13, wherein the fire extinguishing agent is carbon dioxide.

15 15. A method of manufacturing a container skid type fire extinguishing system comprising:
for assembling a plurality of storage containers in which a fire extinguishing agent is stored in a plurality of container skids having an internal space;
for assembling a control device for controlling the plurality of storage containers to at least one of the plurality of container skids; and
20 for preparing a packaging and releasing by interconnecting the plurality of container skids.

16. The method of manufacturing the container skid type fire extinguishing system of claim of 15, wherein the plurality of container skids is an International Organization Standardization (ISO) container conforming to international standard to be shipped to the ship and is painted for preventing of corrosion.

5

17. The method of manufacturing the container skid type fire extinguishing system of claim 15, wherein the storage container assembling step includes for preparing the plurality of container skids, for preparing a plurality of the storage containers and packaging them with each other; and for assembling the packaged plurality of storage containers to the plurality of
10 container skids.

18. The method of manufacturing the container skid type fire extinguishing system of claim 17, wherein the plurality of storage containers is assembled to a whole area in at least one of the plurality of container skids, and the plurality of storage containers and the control devices are
15 assembled adjacent to each other to in another one of the plurality of container skids.

19. The method of manufacturing the container skid type fire extinguishing system of claim 15, wherein the storage container assembling step includes for mounting a main pipe which is a passage of the fire extinguishing agent, to one side of the plurality of container skids, and for
20 connecting the packaged plurality of storage containers with the main pipe through the manifold.

20. The method of manufacturing the container skid type fire extinguishing system of claim

15, wherein the storage container assembling step includes for packaging the plurality of storage containers in state in which a guider provided in close contact with an outer surface of the plurality of storage containers is disposed between the plurality of storage containers, and for supporting a posture of the packaged plurality of storage container to the container skid so that the plurality of storage containers does not flow.

21. The method of manufacturing a container skid type fire extinguishing system of claim 20, wherein the guider may include a first guider extending integrally from the container skid and a second guider disposed between the plurality of storage containers and formed of a shock absorbing material capable of absorbing external force.

22. The method of manufacturing the container skid type fire extinguishing system of claim 15, wherein the storage container assembling step includes for connecting the plurality of storage containers with a weight measuring member to measure weights of the plurality of storage containers assembled to the container skid.

23. The method of manufacturing the container skid type fire extinguishing system of claim 15, wherein the control device assembling step includes for installing the control device inside the container skid so as to be adjacent to the plurality of storage containers, wherein the control device includes at least one of a smoke detection panel, a control valve cabinet in which a control valve is installed, an extension panel, an instruction manual, a release control cabinet, a main emergency power supply switch, a main valve, a fan motor unit skid, a time delay unit, a fire

detection panel synchrony assembly, a junction box, a smoke detection relay box, a fire extinguishing agent alarm relay box, and a pressure switch.

24. The method of manufacturing the container skid type fire extinguishing system of claim
5 15, wherein the preparing the packaging and releasing step includes for connecting the control device to the plurality of storage containers so that the control device assembled to at least one of the plurality of container skids controls the plurality of storage containers assembled to the plurality of container skids.