Floating construction

The present invention relates to a floating construction comprising a vessel or container filled fully or partially with water and the lower portion of the container is located within a surrounding body of water, wherein the walls of the container are transparent or contain transparent sections, and the container comprises one or more open openings for entering the container, which open opening or openings are located below surface level of the surrounding body of water, and the floating construction comprising a space for spectators for observing actions taking place in the container.

Patent application PCT/FI2012/050726 discloses an apparatus for underwater activities, which apparatus comprises a vessel or container filled fully or partially with water, which vessel comprises one or more open openings for entering the vessel, wherein the lower portion of the vessel is located within a body of water, all of the one or more open openings for entering the vessel are located in that portion of the vessel which is located under the surface level of the body of water, and the walls of the vessel are transparent, or the walls comprise sections that are transparent, for allowing observation of the activities taking place inside the vessel from outside of the vessel. One disclosed embodiment comprises a floating platform connected to this type of an apparatus, wherein the floating platform may be equipped with a space for spectators, including seating and other types of services for the spectators.

With this type of floating platform the water mass inside the container or vessel is significant, and causes problems for the floating construction and its structural integrity especially in situations where the water mass inside the container needs to be removed quickly.

Embodiments of the present invention provide a solution for emptying the water filled container within a floating construction safely, quickly and in controlled manner.

In the floating construction according to embodiments of the present invention, at least one ballast tank, which ballast tank has a water connection to the surrounding body of water, is connected to the container with a controllable pressure connection.

In the solution according to embodiments of the present invention, when the pressure connection between the ballast tank or tanks and the container is opened, the water inside the container can escape from the container to the surrounding body of water, and the underpressure or vacuum created by the water escaping the container is used to fill the ballast tank. This way the water filling the ballast tank compensates the water escaping from the container.

In the context of embodiments of the present invention, a controllable pressure connection means suitable connection between the ballast tank or tanks and the container which connection, when closed allows a pressure difference between inner side of the ballast tank or tanks and inner side of the container, and when opened allows the pressure difference to equalize.

In the context of embodiments of the present invention, a controllable water connection between the ballast tank or tanks and the surrounding body of water means suitable connection allowing water from the surrounding body of water to enter and exit the ballast tank or tanks in controlled manner.

Both the controllable pressure connection and the controllable water connection may be implemented with pipe and control valve arrangement, for example.

In the floating construction according to embodiments of the invention, the container is filled fully or partially with water, which partial filling of the container means that inside the container there is sufficient amount of water to allow underwater activities to take place within the amount of water in the container, and allow these activities to be observed though the walls of the container. Thus the water surface level inside the container in operation condition is significantly higher than the water surface level of the surrounding body of water. This also means that the water, and possible remaining air, inside the container is in underpressure so that water remains inside the container and does not escape through the open opening(s) located below the surface level of the surrounding body of water.

In the floating construction according to embodiments of the invention, the pressure connection is advantageously located between the upper portion of the at least one ballast tank and the upper portion of the container. This embodiment allows faster equalization of the pressure difference, since the pressure difference is at maximum in the starting situation.

Advantageously, in the floating construction according to embodiments of the invention, there is at least two substantially same sized ballast tanks located on opposite sides of the container, and both of the ballast tanks are connected to the container with a controllable pressure connection. Use of a plurality of ballast tanks allows faster emptying of the container, and equal filling of the ballast tanks which leads to more controlled emptying process of the container.

The floating construction according to embodiments of the present invention may also comprise a pumping system, which can be used to control the amount of water inside the at least one ballast tank and/or inside the container.

The floating construction of embodiments of the invention advantageously comprises a control system for controlling the controllable pressure connection and/or the controllable water connection, as well as other relating apparatuses, such as pumps, for example.

According to an aspect, there is provided floating construction comprising a container filled fully or partially with water, the lower portion of the container being located within a surrounding body of water and the water surface level of the surrounding body of water being substantially lower that the water surface level inside the container, the container comprising transparent walls or walls with transparent sections and at least one open opening for entering the container, which at least one open opening is located below the surface level of the surrounding body of water, and which floating construction comprises space for spectators for observing activities taking place inside the container, characterized in that the floating construction comprises at least one ballast tank, which ballast tank is connected to the container with a controllable pressure connection, and which ballast tank has controllable water connection to the surrounding body of water.

Exemplifying embodiments of the invention and their advantages are explained in greater detail below in the sense of example and with reference to accompanying drawings, where:

Figure 1 shows schematically a cross-sectional view of an embodiment of the invention, and

Figure 2 shows schematically a cross-sectional view of an alternative embodiment of the invention.

Figure 1 shows schematically a cross sectional view of a floating construction 1, which comprises a container 2 for water which container is air and water-tight, with the exception of the open bottom surface. On both sides of the container 2 is located ballast tanks 3, 3'. Upper portions of the ballast tanks 3, 3' are connected to the upper portion of the container through controllable pressure connection in form of pipes 4, 4' and controllable valves 5, 5', which controlled pressure connections connects the inner sides of the ballast tanks and the container. The ballast tanks 3, 3' are also equipped with controllable water connection to the surrounding body of water, when the floating construction 1