FLOATATION ASSEMBLY AND FLOATING ARRANGEMENT

Technical Field

[0001] Various embodiments generally relate to a floatation assembly and a floating arrangement. In particular, various embodiments generally relate to a floatation assembly, for supporting a unitary structure (e.g. a solar panel) afloat, and a floating arrangement that includes the floatation assembly.

Background

[0002] In recent times, the application and development of floating solar energy have been actively promoted. To achieve high output and to boost efficiency of solar power generation, sizes of solar panels developed and deployed out into open seas and oceans have progressively increased. As the sizes of such solar panels increase, they call for a need for larger-sized floating systems capable of supporting such large-sized solar panels.

[0003] Typically, manufacturers of floating systems use a molding machine to produce or manufacture such floating systems.

[0004] However, some manufactures face a strain when the specifications (or sizes) of floating systems requested exceed a limit or capability of their molding machines.

[0005] Moreover, even where large-sized floating systems are successfully produced or manufactured, the cost of manufacturing and transporting these large structures are high.

[0006] Accordingly, there is a need for a floatation assembly (e.g. a floating system) and a floating arrangement that includes the floatation assembly, which may be manufactured efficiently, may be portable and cost-effective to transport while being capable of providing sturdy support to keep a unitary structure (e.g. a solar panel) afloat in open seas and oceans, to thereby address the above issues.

Summary

[0007] According to various embodiments, there may be provided a floatation assembly for supporting a unitary structure afloat. The unitary structure may be releasably attachable to the floatation assembly. The floatation assembly may include at least two support-floatation-units. Each support-floatation-unit may include a primary connection portion.

The primary connection portions of the at least two support-floatation-units may be coupled together to form an overlapping rigid connection so as to be free of relative movement between the at least two support-floatation-units.

[0008] According to various embodiments, there may be provided a floating arrangement for supporting a unitary structure. The floating arrangement may include the floatation assembly, according to various embodiments. The floating arrangement may further include at least one connecting-floatation-unit including an elongate body. According to various embodiments, an end portion of one of the at least two support-floatation-units of the floatation assembly of the floating arrangement may be coupled to the elongate body of the at least one connecting-floatation-unit of the floating arrangement.

Brief description of the drawings

[0009] In the drawings, like reference characters generally refer to the same parts throughout the different views. The drawings are not necessarily to scale, emphasis instead generally being placed upon illustrating the principles of the invention. In the following description, various embodiments are described with reference to the following drawings, in which:

FIG. 1A shows a side schematic view of a floatation assembly for supporting a unitary structure, with the unitary structure detached from the floatation assembly, according to various embodiments;

FIG. 1B shows a side schematic view of the floatation assembly of FIG. 1A, with the unitary structure releasably attached to the floatation assembly, according to various embodiments;

FIG. 1C shows an isolated view of an overlapping rigid connection of the floatation assembly of FIG. 1A, with primary connection portions of the floatation assembly coupled together, according to various embodiments;

FIG. 1D shows an isolated view of the primary connection portions of FIG. 1C decoupled from each other, according to various embodiments;

FIG. 1E shows a side schematic view of a floating arrangement which includes the floatation assembly of FIG. 1A and at least one connecting-floatation-unit, with the at least one connecting-floatation-unit decoupled from the floatation assembly, according to various embodiments;

FIG. 1F shows a side schematic view of the floating arrangement of FIG. 1E, with the at least one connecting-floatation-unit coupled to the floatation assembly, according to various embodiments;

FIG. 1G shows a side schematic view of a first variant floating arrangement which includes at least one floatation assembly of FIG. 1A coupled to at least two connecting-floatation-units, according to various embodiments;

FIG. 1H shows a side schematic view of a second variant floating arrangement which includes at least one connecting-floatation-unit interconnecting at least two floating assemblies of FIG. 1A, according to various embodiments;

FIG. 2A shows a top perspective view of a floatation assembly with at least two support-floatation-units coupled together in a manner so as to cross over each other, according to various embodiments;

FIG. 2B shows an exploded perspective view of the floatation assembly of FIG. 2A, according to various embodiments;

FIG. 2C shows a top view of the floatation assembly of FIG. 2A, according to various embodiments;

FIG. 2D shows a top view of a first support-floatation-unit and a second support-floatation-unit of the at least two support-floatation-units of FIG. 2A, according to various embodiments;

FIG. 2E shows a bottom perspective view of the floatation assembly of FIG. 2A, according to various embodiments;

FIG. 2F shows an exploded perspective view of FIG. 2E, according to various embodiments;

FIG. 2G shows a bottom view of the floatation assembly of FIG. 2A, according to various embodiments;

FIG. 2H shows a bottom view of the first support-floatation-unit and the second support-floatation-unit of FIG. 2A, according to various embodiments;

FIG. 2I shows a close-up top perspective view of a primary connection portion of the first support-floatation-unit, according to various embodiments;

FIG. 2J shows a close-up bottom perspective view of the primary connection portion of the first support-floatation-unit, according to various embodiments;

FIG. 2K shows a close-up top perspective view of a primary connection portion of the second support-floatation-unit, according to various embodiments;

FIG. 2L shows a close-up bottom perspective view of the primary connection portion of the second support-floatation-unit, according to various embodiments;

FIG. 2M shows a top perspective view of an overlapping rigid connection, according to various embodiments;

FIG. 2N shows a bottom perspective view of the overlapping rigid connection of FIG. 2M, according to various embodiments;

FIG. 2O shows a side view of the floatation assembly of FIG. 2A viewed from a lateral end of the first and the second support-floatation-units, according to various embodiments;

FIG. 2P shows a close-up bottom perspective view of a securing element, from a first orientation, according to various embodiments;

FIG. 2Q shows a close-up bottom perspective view of the securing element, from a second orientation, according to various embodiments;

FIG. 2R shows a close-up perspective view of a pin structure, according to various embodiments;

FIG. 2S shows a front view of the floatation assembly of FIG. 2A viewed from a first longitudinal end of the first and the second support-floatation-units, according to various embodiments;

FIG. 2T shows a top view of a floating arrangement, which includes the floatation assembly of FIG. 2A and at least one connecting-floatation-unit, according to various embodiments;

FIG. 2U shows a perspective view of the connecting-floatation-unit of the floating arrangement of FIG. 2T, according to various embodiments;

FIG. 3A shows a perspective view of a floatation assembly with at least two support-floatation-units, each support-floatation-unit including a connecting region between a first floatation segment and a second floatation segment, according to various embodiments;

FIG. 3B shows a top view of a floating arrangement including the floatation assembly of FIG. 3A, according to various embodiments;

FIG. 3C shows a perspective view of a connecting-floatation-unit of the floating arrangement of FIG. 3B, according to various embodiments;

FIG. 4A shows a perspective view of a connecting-floatation-unit including at least one laterally-directed-connection-portion, according to various embodiments;

FIG. 4B shows a perspective view of a first variant connecting-floatation-unit of the connecting-floatation-unit of FIG. 4A, according to various embodiments; and

FIG. 4C shows a perspective view of a second variant connecting-floatation-unit of the connecting-floatation-unit of FIG. 4A, according to various embodiments.

Detailed description

[00010] Embodiments described below in the context of the apparatus are analogously valid for the respective methods, and vice versa, as well as for a corresponding kit. Furthermore, it will be understood that the embodiments described below may be combined, for example, a part of one embodiment may be combined with a part of another embodiment.

[00011] It should be understood that the terms “on”, “over”, “top”, “bottom”, “down”, “side”, “back”, “left”, “right”, “front”, “lateral”, “side”, “up”, “down” etc., when used in the following description are used for convenience and to aid understanding of relative positions or directions, and not intended to limit the orientation of any device, or structure or any part of any device or structure. In addition, the singular terms “a”, “an”, and “the” include plural references unless context clearly indicates otherwise. Similarly, the word “or” is intended to include “and” unless the context clearly indicates otherwise.

[00012] The term “unitary structure” may include, but not limited to, a solar panel, solar power generation system, a solar power station etc., or any other structure or installation for any other suitable application, for example, wind turbine, aerator, pump or fish cage etc.

[00013] Various embodiments generally relate to a floatation assembly, for supporting a unitary structure (e.g. a solar panel etc.) afloat, and a floating arrangement which includes the floatation assembly. According to various embodiments, the floatation assembly may include at least two floatable units (e.g. at least two support-floatation-units) which may each include a coupling element (e.g. primary connection portion) at a middle region of each floatable unit. The at least two floatable units may be decoupled from each other, thereby improving the portability of features (or components) of an unassembled floatation assembly, and may be assembled together to form the floatation assembly for supporting a unitary structure (e.g. a solar panel) afloat.

[00014] By having at least two individual (or separable) floatable units, which may be brought together as needed to form the assembled floatation assembly, the floatation assembly may be manufactured more efficiently since the individual floatable units would be smaller in size than other (e.g. conventional) single large-sized floating systems.

[00015] In various embodiments, when the coupling elements (e.g. primary connection portions) of the at least two floatable units are coupled together, they may form an overlapping and rigid connection (e.g. overlapping rigid connection) within the floatation assembly so as to be free of relative movement between the at least two floatable units. Further, in various embodiments, when the coupling elements (e.g. primary connection portions) of the at least two floatable units are coupled together, the at least two floatable units may be intersecting one another about the overlapping and rigid connection such that forces (e.g. bending forces or moments) may be equally distributed around the overlapping and rigid connection, thereby prolonging an operable lifespan of the floatation assembly.

[00016] Various embodiments may also provide a floatation assembly which may be easy to assemble (e.g. in a single step, by coupling or connecting or bringing the coupling elements of the at least two floatable units together), whereby in the assembled configuration the at least two floatable units may be immovable in a translation direction and/or rotational direction. For example, in various embodiments, the coupling elements of each floatable unit may include at least one pin structure (described in detail later) and/or at least one pin-receiving through-hole configured to receive and mate with the at least one pin structure.

[00017] Various embodiments also seek to provide a floating arrangement which includes the floatation assembly. According to various embodiments, the floating arrangement may include at least one (e.g. one or more) floatation assembly and one or more floatable walkway(s) (e.g. connecting-floatation-unit(s)). In the floating arrangement, according to various embodiments, one or more floatable unit(s) may be connected or joined to one or more floatable walkway(s) in any suitable arrangement (e.g. any number, position, orientation etc.). For example, a single floatable unit may be connected or coupled to two floatable walkways (e.g. with one end of the floatable unit connected to one of the two walkways and another end of the floatable unit connected to the other of the two walkways), and the two floatable walkways may be either connected or spaced apart from each other. As another example, a single floatable unit may be connected to a single floatable walkway (e.g. by two ends of the floatable unit).

[00018] The following examples pertain to further embodiments:

[00019] Example 1 is a floatation assembly for supporting a unitary structure afloat. The unitary structure may be releasably attachable to the floatation assembly. The floatation assembly may include: at least two support-floatation-units. Each support-floatation-unit may include a primary connection portion. The primary connection portions of the at least

two support-floatation-units may be coupled together to form an overlapping rigid connection so as to be free of relative movement between the at least two support-floatation-units.

[00020] In Example 2, the subject matter of Example 1 may optionally include that: wherein each support-floatation-unit may include at least one securing element, the at least one securing element being capable of forming a releasable attachment with the unitary structure.

[00021] In Example 3, the subject matter of Example 2 may optionally include that: wherein each securing element of each support-floatation-unit may include a securing plate with a plurality of securing holes to which a corresponding securing element of the unitary structure may be releasably attachable.

[00022] In Example 4, the subject matter of Example 3 may optionally include that: wherein the securing plate may be reinforced with a plurality of parallel reinforcing stripes distributed across the securing plate.

[00023] In Example 5, the subject matter of any one of Examples 1 to 4 may optionally include that: wherein the at least two support-floatation-units may be coupled together in a manner so as to cross over each other about the overlapping rigid connection.

[00024] In Example 6, the subject matter of any one of Examples 1 to 5 may optionally include that: wherein the primary connection portion of each support-floatation-unit may include a connection plate including an abutment surface, an outward facing surface opposite the abutment surface, and a primary through-hole extending between the abutment surface and the outward facing surface, wherein the primary connection portions of the at least two support-floatation-units may be coupled together to form the overlapping rigid connection in a manner so as to overlap the connection plates of the primary connection portions of the at least two support-floatation-units with the abutment surfaces thereof respectively directed towards each other, and the primary through-holes thereof respectively aligned to each other.

[00025] In Example 7, the subject matter of Example 6 may optionally include: a bolt inserted through the primary through-holes of the connection plates of the primary connection portions of the at least two support-floatation-units that are aligned to each other; and a nut in engagement with the bolt to lock the connection plates of the primary connection portions of the at least two support-floatation-units together, wherein a head of the bolt and

the nut may be respectively bearing against the outward facing surfaces of the connection plates of the primary connection portions of the at least two support-floatation-units.

[00026] In Example 8, the subject matter of Example 6 or Example 7 may optionally include that wherein the primary connection portion of each support-floatation-unit may include a pair of parallel opposing reinforcing walls extending away from the outward facing surface of the connection plate thereof, wherein the pair of parallel opposing reinforcing walls being respectively on two opposite sides of the primary through-hole of the connection plate, each of the pair of parallel opposing reinforcing walls respectively running along an entire extend across a corresponding region of the connection plate.

[00027] In Example 9, the subject matter of Example 8 may optionally include that: wherein each of the pair of parallel opposing reinforcing walls may be a single layer wall or a double layer wall.

[00028] In Example 10, the subject matter of Example 9 may optionally include that: wherein, when each of the pair of parallel opposing reinforcing walls is the double layer wall, the double layer wall may include a pair of spaced apart parallel first and second wall layers, a roof layer suspended across the pair of spaced apart parallel first and second wall layers, and a plurality of strengthening structures distributed along the double layer wall lengthwise, each strengthening structure extending between the pair of spaced apart parallel first and second wall layers and across the roof layer.

[00029] In Example 11, the subject matter of Example 10 may optionally include that: wherein the plurality of strengthening structures may include a plurality of strengthening ribs, each strengthening rib extending from a base of the first wall layer height-wise to a top of the first wall layer, across the roof layer from the top of the first wall layer to a top of the second wall layer, and from the top of the second wall layer height-wise to a base of the second wall layer; or a plurality of strengthening partition walls, each strengthening partition wall extending perpendicularly across the pair of spaced apart parallel first and second wall layers so as to be across the roof layer.

[00030] In Example 12, the subject matter of any one of Examples 1 to 11 may optionally include that: wherein the primary connection portion of each support-floatation-unit may further include at least one reinforcing ridge.

[00031] In Example 13, the subject matter of Example 12 may optionally include that: wherein the primary connection portion of each support-floatation-unit may further include two reinforcing ridges extending from the outward facing surface of the connection plate

thereof, the two reinforcing ridges being respectively aligned to two opposite radial directions extending from a center of the primary through-hole of the connection plate along the outward facing surface, the two opposite radial directions being parallel to the pair of parallel opposing reinforcing walls.

[00032] In Example 14, the subject matter of any one of Examples 1 to 13 may optionally include that: wherein the primary connection portion of each support-floatation-unit may include at least one pin structure, and at least one pin-receiving through-hole.

[00033] In Example 15, the subject matter of Example 14 may optionally include that: wherein the at least one pin structure extends perpendicularly away from the abutment surface of the connection plate thereof, and the at least one pin-receiving through-hole extends through the connection plate thereof, wherein the primary connection portions of the at least two support-floatation-units are coupled together to form the overlapping rigid connection with the at least one pin structure of the connection plate of the primary connection portion of a first of the at least two support-floatation-units inserted through the at least one pin-receiving through-hole of the connection plate of the primary connection portion of a second of the at least two support-floatation-units and the at least one pin structure of the connection plate of the primary connection portion of the second of the at least two support-floatation-units inserted through the at least one pin-receiving through-hole of the connection plate of the primary connection portion of the first of the at least two support-floatation-units.

[00034] In Example 16, the subject matter of Example 15 may optionally include that: wherein the primary connection portion of each support-floatation-unit may include two or more pin structures and two or more pin-receiving through-holes, wherein the two or more pin structures and the two or more pin-receiving through-holes may be arranged in an alternating manner around the primary through-hole.

[00035] In Example 17, the subject matter of Example 14 to Example 16 may optionally include that: wherein each pin structure of the primary connection portion of each support-floatation-unit may include a split end portion that forms at least two cantilever members extending from the abutment surface of the connection plate thereof.

[00036] In Example 18, the subject matter of Example 17 may optionally include that: wherein each cantilever member may include an overhang element protruding sideways from a tip of each cantilever member, wherein the overhang elements of the at least two

cantilever members may be directed away from each other for hooking a corresponding pin-receiving through-hole when inserted therein.

[00037] In Example 19, the subject matter of any one of Examples 1 to 18 may optionally include that: wherein each support-floatation-unit may be of a non-symmetrical shape with the one primary connection portion being in the middle.

[00038] In Example 20, the subject matter of Example 19 may optionally include that: wherein each support-floatation-unit may be of a S-shape or Z-shape.

[00039] In Example 21, the subject matter of any one of Examples 1 to 20 may optionally include: wherein each support-floatation-unit may include a first floatation segment and a second floatation segment respectively adjoined to opposite edges of the primary connecting portion in a manner such that the primary connecting portion interconnects the first floatation segment and the second floatation segment.

[00040] In Example 22, the subject matter of Example 21 may optionally include that: wherein each of the first floatation segment and the second floatation segment of each support-floatation-unit may include a channel formation extending along a roof surface thereof with a channel opening at an end of the channel formation opening at an edge of the roof surface for directing a liquid to flow along the channel formation and out of the roof surface.

[00041] In Example 23, the subject matter of Example 22 may optionally include that: wherein the channel formation may include a channel floor that slopes downwards to the channel opening, so as to enable a liquid to flow along the channel floor towards the channel opening.

[00042] In Example 24, the subject matter of any one of Example 21 to Example 23 may optionally include that: wherein each of the first floatation segment and the second floatation segment of each support-floatation-unit may further include at least one end-connection portion, wherein the at least one end-connection portion protrudes sideways from a side wall of each of the first floatation segment and the second floatation segment of each support-floatation-unit.

[00043] In Example 25, the subject matter of Example 24 may optionally include that: wherein the side wall is reinforced with at least one reinforcing border in a form of a border wall thicker than other walls of each support-floatation-unit.

[00044] In Example 26, the subject matter of any one of Examples 1 to 25 may optionally include that: wherein the primary connection portion of each support-floatation-unit includes at least one drain hole.

[00045] Example 27 is a floating arrangement for supporting a unitary structure. The floating arrangement may include: the floatation assembly of any one of Examples 1 to 26, and at least one connecting-floatation-unit that includes an elongate body, wherein an end portion of one of the at least two support-floatation-units of the floatation assembly may be coupled to the elongate body of the at least one connecting-floatation-unit.

[00046] In Example 28, the subject matter of Example 27 may optionally include that: wherein the elongate body of the at least one connecting-floatation-unit may include a first longitudinal end and a second longitudinal end, wherein the end portion of the one of the at least two support-floatation-units of the floatation assembly may be coupled to the first longitudinal end of the elongate body and an end portion of another one of the at least two support-floatation-units of the floatation assembly may be coupled to the second longitudinal end of the elongate body such that the elongate body of the at least one connecting-floatation-unit may be connected across the end portions of the at least two support-floatation-units of the floatation assembly.

[00047] In Example 29, the subject matter of Example 27 may optionally include: two floatation assemblies, wherein the elongate body of the at least one connecting-floatation-unit may include a first portion and a second portion, wherein the end portion of the one of the at least two support-floatation-units of a first of the two floatation assemblies may be coupled to the first portion of the elongate body and the end portion of the at least two support-floatation-units of a second of the two floatation assemblies may be coupled to the second portion of the elongate body such that the elongate body of the at least one connecting-floatation-unit interconnects the two floatation assemblies.

[00048] In Example 30, the subject matter of Example 29 may optionally include that: wherein the first portion of the elongate body of the at least one connecting-floatation-unit is a first longitudinal end of the elongate body and the second portion of the elongate body of the at least one connecting-floatation-unit is a second longitudinal end of the elongate body.

[00049] FIG. 1A shows a side schematic view of a floatation assembly 1000 for supporting a unitary structure 90, with the unitary structure 90 detached from the floatation assembly 1000, according to various embodiments; and FIG. 1B shows a side schematic

view of the floatation assembly 1000 of FIG. 1A, with the unitary structure 90 releasably attached to the floatation assembly 1000, according to various embodiments.

[00050] According to various embodiments, there may be provided the floatation assembly 1000. According to various embodiments, the floatation assembly 1000 may include a property of being buoyant. Accordingly, the floatation assembly 1000 may be configured to or may be suitable for supporting the unitary structure 90 afloat a body of water (e.g. out at sea or dam or river or pond etc.). The unitary structure 90 may be, for example, a solar power generation system, a solar power station, a solar panel etc. or any other structure or installation for any other suitable application.

[00051] According to various embodiments, the floatation assembly 1000 may include at least two (e.g. two or more) support-floatation-units 1100.

[00052] According to various embodiments, any one or more or all of the at least two support-floatation-units 1100 may have an identical shape (e.g. substantially identical shape, in other words, similar shape or substantially similar shape) with each other.

[00053] According to various other embodiments, any one or more or all of the at least two support-floatation-units 1100 may have a different shape from each other.

[00054] According to various embodiments, any one or more or all of the at least two support-floatation-units 1100 may be of or may include a symmetrical shape, for example, an “I” shape, a “V” shape, a “U” shape, a “T” shape, butterfly-like shape etc. In other words, according to various embodiments, any one or more or all of the at least two support-floatation-units 1100 may be symmetrical about a longitudinal axis of the support-floatation-unit 1000.

[00055] According to various other embodiments, any one or more or all of the at least two support-floatation-units 1100 may be of or may include a non-symmetrical shape, for example, a “S” shape, a “Z” shape etc. In other words, according to various embodiments, any one or more or all of the at least two support-floatation-units 1100 may be non-symmetrical about a longitudinal axis of the support-floatation-unit 1000.

[00056] According to various embodiments, each support-floatation-unit 1100 of the at least two support-floatation-units 1100 may include a respective primary connection portion 1150, 1550. According to various embodiments, the primary connection portion 1150, 1550 of each support-floatation-unit 1100 may be located or positioned at a middle (e.g. middle point or middle region) of the support-floatation-unit 1100 between opposite longitudinal ends or longitudinal end regions of the support-floatation-unit 1100.

[00057] FIG. 1C shows an isolated view of an overlapping rigid connection 1800 of the floatation assembly 1000, with the primary connection portions 1150, 1550 coupled together, according to various embodiments; and FIG. 1D shows an isolated view of the primary connection portions 1150, 1550 of FIG. 1C decoupled from each other, according to various embodiments.

[00058] With reference to FIG. 1A to FIG. 1D, according to various embodiments, the primary connection portions 1150, 1550 of the at least two support-floatation-units 1100 may be coupled together to form the overlapping rigid connection 1800 so as to be free of relative movement between the at least two support-floatation-units 1100.

[00059] For example, according to various embodiments, the overlapping rigid connection 1800 may be a lap joint (e.g. cross lap joint) between the at least two support-floatation-units 1100, whereby the at least two support-floatation-units 1100 may be free of relative movement (e.g. rotational movement about a centroid or axial axis of the overlapping rigid connection 1800) between the at least two support-floatation-units 1100.

[00060] As another example, according to various embodiments, the primary connection portion 1150, 1550 of each support-floatation-unit 1100 of the at least two support-floatation-units 1100 may include at least one pin structure 1360 and at least one pin-receiving through-hole 1365. The at least one pin structure 1360 of each primary connection portion 1150, 1550 of each support-floatation-unit 1100 may extend substantially perpendicularly away from an inward facing surface (e.g. an "abutment surface") 1153, 1553 of the primary connection portion 1150, 1550. Each pin structure 1360 may include, but is not limited to, a tubular pin structure, a columnar (e.g. circular, square, rectangular, etc.) pin structure etc. According to various embodiments, each primary connection portion 1150, 1550 may include an outward facing surface 1154, 1554 opposite the inward facing surface 1153, 1553. The at least one pin-receiving through-hole 1365 of each primary connection portion 1150, 1550 of each support-floatation-unit 1100 may extend through the primary connection portion 1150, 1550 along an axial axis of the primary connection portion 1150, 1550 extending perpendicularly between the inward facing surface 1153, 1553 and the outward facing surface 1154, 1554 of the primary connection portion 1150, 1550. According to various embodiments, the primary connection portions 1150, 1550 of the at least two support-floatation-units 1100 may be coupled together to form the overlapping rigid connection 1800, with the at least one pin structure 1360 of the primary connection portion 1150, 1550 of a first (or one) support-floatation-unit 1100 of the at least two support-

floatation-units 1100 inserted through the at least one pin-receiving through-hole 1365 of the primary connection portion 1150, 1550 of a second (or another) support-floatation-unit 1100 of the at least two support-floatation-units 1100 and with the at least one pin structure 1360 of the primary connection portion 1150, 1550 of the second (or the other) of the at least two support-floatation-units 1100 inserted through the at least one pin-receiving through-hole 1365 of the primary connection portion 1150, 1550 of the first of the at least two support-floatation-units 1100, whereby the at least two support-floatation-units 1100 may be free of relative movement (e.g. rotational movement about a centroid or axial axis of the overlapping rigid connection 1800) between the at least two support-floatation-units 1100.

[00061] According to various other embodiments, the primary connection portion 1150, 1550 of either only the first or the second support-floatation-unit 1100 may include at least one pin structure 1360, while the primary connection portion 1150, 1550 of the other (e.g. remainder) of the first or the second support-floatation-unit 1100 may include at least one pin-receiving through-hole 1365 for receiving the at least one pin structure 1360.

[00062] Accordingly, when the overlapping rigid connection 1800 is formed, according to various embodiments, abutment surfaces 1153, 1553 of the primary connection portions 1150, 1550 of the at least two support-floatation-units 1100 may be directed towards each other (in other words, facing each other) and may be either contacting each other or having a small gap or space between each other.

[00063] According to various embodiments, each pin structure 1360 of the primary connection portion 1150, 1550 of each support-floatation-unit 1100 may include a split end portion which may form at least two (e.g. two or more than two) cantilever members (described in detail later) extending from the inward facing surface (or abutment surface) 1153, 1553 of the primary connection portion 1150, 1550. According to various embodiments, the split end portion may include, but is not limited to, a “V”-shaped end (e.g. having a “V”-shaped prong), a double-pronged end portion, a triple-pronged end portion, etc.

[00064] According to various other embodiments, each pin structure 1360 of the primary connection portion 1150, 1550 of each support-floatation-unit 1100 may include a base portion (e.g. a stem) (described in detail later) extending from and/or adjoined to the inward facing surface (or abutment surface) 1153, 1553 of the primary connection portion 1150, 1550. According to various embodiments, the base portion (e.g. a stem) may be an

uninterrupted segment (e.g. uninterrupted tubular or columnar segment) of the pin structure 1360. According to various embodiments, the at least two cantilever members may extend from a tip or an end surface of the base portion (as shown, for example, in FIG. 2I and FIG. 2L). According to various embodiments, the base portion (e.g. a column or a stem), positioned between and adjoined to a corresponding inward facing surface (or abutment surface) 1153, 1553 of a corresponding primary connection portion 1150, 1550 and a corresponding at least two cantilever members, may serve to strengthen (or improve the strength of) a joint or connection between the corresponding at least two cantilever members and the corresponding inward facing surface (or abutment surface) 1153, 1553. Thus, for example, when the overlapping rigid connection 1800 is formed, the at least two cantilever members may be prevented from breaking away from the corresponding inward facing surface (or abutment surface) 1153, 1553 by way of the adjoining base portion (e.g. the stem).

[00065] According to various other embodiments, each pin structure 1360 may be free of or without the uninterrupted base portion. Accordingly, according to various other embodiments, the at least two cantilever members may be extending directly or immediately from the inward facing surface (or abutment surface) 1153, 1553 of the primary connection portion 1150, 1550 of each support-floatation-unit 1100. In other words, according to various other embodiments, each of the at least two cantilever members may be immediately adjoined to the inward facing surface (or abutment surface) 1153, 1553 of the primary connection portion 1150, 1550 of each support-floatation-unit 1100.

[00066] According to various embodiments, each cantilever member may include a property of being resilient (in other words, flexible, or capable of bending or flexing under an external force applied on the cantilever member, and thereafter returning or biasing or springing back to its original or initial form or position after the external force is released). Further, according to various embodiments, each cantilever member may include an overhang element protruding sideways or laterally from a tip (e.g. free end tip or end region) of each cantilever member. According to various embodiments, the overhang element may include, but is not limited to, a hook, a catch, etc. According to various embodiments, the overhang elements of the at least two cantilever members, of each pin structure 1360 of the primary connection portion 1150, 1550 of each support-floatation-unit 1100 of the at least two support-floatation-units 1100, may be directed away from each other in a manner configured to or suitable for hooking or catching a corresponding pin-receiving through-

hole 1365 (i.e. of another support-floatation-unit 1100 of the at least two support-floatation-units 1100) when inserted therein, whereby the at least two support-floatation-units 1100 may be free of relative movement (e.g. translational / linear movement along the centroid or axial axis of the overlapping rigid connection 1800) between the at least two support-floatation-units 1100.

[00067] According to various other embodiments (not shown), each pin structure 1360 (e.g. a tubular pin structure, a columnar pin structure etc.) may include the overhang element protruding sideways or laterally from a tip of the pin structure 1360 (e.g. a tubular pin structure, a columnar pin structure etc.) without any cantilever member therealong. In other words, each pin structure 1360 may be in the form of a single solid upright structure, and the overhang element may be protruding in a horizontal direction from the tip of the pin structure 1360.

[00068] According to various embodiments, when the primary connection portion 1150, 1550 of each support-floatation-unit 1100 includes two or more pin structures 1360 and two or more pin-receiving through-holes 1365, the two or more pin structures 1360 and the two or more pin-receiving through-holes 1365 may be arranged in an alternating manner around a centroid or the axial axis (i.e. extending perpendicularly between the inward facing surface 1153, 1553 and the outward facing surface 1154, 1554 of the primary connection portion 1150, 1550) of the primary connection portion 1150, 1550. According to various embodiments, the two or more pin structures 1360 and the two or more pin-receiving through-holes 1365 arranged in the alternating manner may be spaced uniformly (e.g. equidistance) apart from each other (e.g. with respect to an immediately adjacent or neighboring pin structure 1360 / pin-receiving through-hole 1365) around the centroid or the axial axis of the primary connection portion 1150, 1550 of each support-floatation-unit 1100.

[00069] According to various other embodiments, the two or more pin structures 1360 and the two or more pin-receiving through-holes 1365, arranged in the alternating manner, may be spaced non-uniformly apart from each other around the centroid or axial axis of the primary connection portion 1150, 1550 of each support-floatation-unit 1100.

[00070] According to various embodiments, a position (or an arrangement) of the at least one pin structure 1360 and the at least one pin-receiving through-hole 1365 of each primary connection portion 1150, 1550 of each support-floatation-unit 1100 (in other words, each pin structure 1360 and each pin-receiving through-hole) may serve as an alignment aid (or

reference) configured to or for orientating the at least two support-floatation-units 1100 with respect to each other such that the at least two support-floatation-units 1100 may be aligned with respect to each other and brought together to form the overlapping rigid connection 1800.

[00071] According to various embodiments, the primary connection portion 1150, 1550 of each support-floatation-unit 1100 of the at least two support-floatation-units 1100 may include a primary through-hole 1366. The primary through-hole 1366 of each primary connection portion 1150, 1550 of each support-floatation-unit 1100 may extend across the primary connection portion 1150, 1560 (e.g. between the inward facing surface 1153, 1553 and the outward facing surface 1154, 1554 thereof) along the axial axis of the primary connection portion 1150, 1550. According to various embodiments, the primary connection portions 1150, 1550 of the at least two support-floatation-units 1100 may overlap each other or may be stacked in a manner such that the primary through-holes 1366 of the primary connection portions 1150, 1550 of the at least two support-floatation-units 1100 may be aligned with each other. A bolt (not shown) may be inserted through the aligned primary through-holes 1366 of the primary connection portions 1150, 1550 of the at least two support-floatation-units 1100. Further, a nut (not shown) may engage (e.g. be fastened to, coupled to, threaded to etc.) the bolt to lock the primary connection portions 1150, 1550 of the at least two support-floatation-units 1100 together. With the nut in engagement with the bolt, according to various embodiments, a head of the bolt and the nut may respectively bear against (e.g. directly abut against, or with another component, e.g. washer, therebetween) a respective outward facing (e.g. exposed) surface 1154, 1554 of the primary connection portions 1150, 1550 of the at least two support-floatation-units 1100.

[00072] According to various embodiments, the primary through-hole 1366 of each primary connection portion 1150, 1550 of each support-floatation-unit 1100 may be arranged or disposed at a centroid or center of the primary connection portion 1150, 1550 such that a hole-axis of the primary through-hole 1366 may be coaxial or may coincide or may rest or extend along the axial axis of the primary connection portion 1150, 1550. Accordingly, when the primary connection portion 1150, 1550 of each support-floatation-unit 1100 of the at least two support-floatation-units 1100 includes two or more pin structures 1360 and two or more pin-receiving through-holes 1365, according to various embodiments, the two or more pin structures 1360 and the two or more pin-receiving

through-holes 1365 may be arranged in an alternating manner around or about the primary through-hole 1366.

[00073] According to various embodiments, each support-floatation-unit 1100 of the at least two support-floatation-units 1100 may include at least one (e.g. one, two, or more than two) securing element 1380 configured to or which may be capable of forming a releasable attachment with the unitary structure 90. Accordingly, according to various embodiments, the unitary structure 90 may be releasably attachable to the floatation assembly 1000 (i.e. via the securing elements 1380 of the at least two support-floatation-units 1100).

[00074] According to various embodiments, each securing element 1380 of each support-floatation-unit 1100 may be positioned at a respective longitudinal end region of the support-floatation-unit 1100. The longitudinal end region may be an uninterrupted region of the support-floatation-unit 1100 which may run or extend between a point immediately adjacent to a corresponding primary connection portion 1150, 1550 and a longitudinal end or terminal end of the support-floatation-unit 1100 furthest away from the point immediately adjacent to the corresponding primary connection portion 1150, 1550 (along a same segment of the support-floatation-unit 1100).

[00075] Accordingly, when each support-floatation-unit 1100 includes two or more securing elements 1380, according to various embodiments, the primary connection portion 1150, 1550 of each support-floatation-unit 1100 may be positioned between the two or more securing elements 1380, along the support-floatation-unit 1100.

[00076] According to various embodiments, when each support-floatation-unit 1100 of the at least two support-floatation-units 1100 includes at least one securing element 1380, the at least two support-floatation-units 1100 may be coupled together in a manner so as to provide an arrangement of at least two securing elements 1380 distributed (e.g. evenly distributed or unevenly distributed) around the overlapping rigid connection 1800 so as to support (e.g. evenly support or unevenly support) the unitary structure 90 releasably attachable to the arrangement of at least two securing elements 1380. For example, according to various embodiments, the at least two support-floatation-units 1100 may be coupled together in a manner so as to provide an arrangement of at least two securing elements 1380 distributed (e.g. evenly distributed) and equidistant from a center of the overlapping rigid connection 1800 for or in a manner so as to support (e.g. evenly support) the unitary structure 90 releasably attachable to the arrangement of at least two securing elements 1380.

[00077] According to various embodiments, each support-floatation-unit 1100 of the at least two support-floatation-units 1100 may include two or more securing elements 1380. Accordingly, when each support-floatation-unit 1100 of the at least two support-floatation-units 1100 includes two or more securing elements 1380, according to various embodiments, the at least two support-floatation-units 1100 may be coupled together in a manner so as to provide an arrangement of four or more securing elements 1380 symmetric about at least two lines of symmetry (e.g. two perpendicular lines of symmetry, or a horizontal line of symmetry and a vertical line of symmetry) for or in a manner so as to support (e.g. evenly support) the unitary structure 90 releasably attachable to the arrangement of at least four or more securing elements 1380.

[00078] According to various embodiments, the at least one securing element 1380, of each support-floatation-unit 1100 of the at least two support-floatation-units 1100, may include, but is not limited to, bolt and nut, screw and screw thread, latch, catch, locking pin, snap fastener, snap fitting, cable/rope and/or anchor for the cable/rope, hook etc.

[00079] According to various embodiments, each securing element 1380 of each support-floatation-unit 1100 may include a securing plate with a plurality of securing holes to which a corresponding securing element 91 of the unitary structure 90 may be releasably attachable. According to various embodiments, each securing plate may be reinforced with one or a plurality of reinforcing stripe(s) or ridge(s) distributed across or along the securing plate. According to various embodiments, when the securing plate is reinforced with the plurality of reinforcing stripes or ridges, the plurality of reinforcing stripes or ridges may be parallel with one another. According to various embodiments, the plurality of securing holes may be a plurality of blind holes and/or a plurality of through-holes (e.g. threaded blind holes and/or threaded through-holes) extending across the support-floatation-unit 1100. The securing element 91 of the unitary structure 90 may be a plurality of protrusion members (e.g. threaded bolts) which may be respectively inserted into the plurality of through-holes (i.e. the plurality of securing holes of the support-floatation-unit 1100) so as to form the releasable attachment between the at least two support-floatation-units 1100 and the unitary structure 90.

[00080] According to various other embodiments, each securing element 1380 of each support-floatation-unit 1100 may include or may be a portion or segment of the support-floatation-unit 1100 itself (e.g. a portion or segment of a main body of the support-floatation-unit 1100) which may, for example, serve as an anchor for a corresponding

securing element 91 (e.g. cable/rope) of the unitary structure 90 to be fastened (e.g. wound or tied around or tied) to that portion of the support-floatation-unit 1100. According to various other embodiments, the said portion of the support-floatation-unit 1100 (i.e. serving as a securing element 1380) may be free from or without any additional modification thereto and/or without any fixture or detachable component (e.g. a bracket or U-bolt) attached thereto.

[00081] According to various embodiments, the at least two support-floatation-units 1100 may be coupled together in a manner so as to cross over each other about the overlapping rigid connection 1800. In other words, according to various embodiments, the at least two support-floatation-units 1100 may be coupled together in a manner so as to intersect each other. For example, according to various embodiments, a first support-floatation-unit 1100 of the at least two support-floatation-units 1100 may be coupled to a second support-floatation-unit 1100 of the at least two support-floatation-units 1100, in a manner such that the first and the second support-floatation-units 1100 may be perpendicular (e.g. substantially perpendicular) to each other so as to form a “cross” or “†” or “+” shape.

[00082] As another example, according to various other embodiments, the first and the second support-floatation-units 1100 of the at least two support-floatation-units 1100 may be coupled to each other in a non-perpendicular manner so as to form an “X” shape.

[00083] According to various embodiments, within the intersecting arrangement of the at least two support-floatation-units 1100, a first (or at least one) support-floatation-unit 1100 of the at least two support-floatation-units 1100 may be positioned or arranged beneath (or stacked below) a second (or remainder) support-floatation-unit(s) of the at least two support-floatation-units 1100 such that the first support-floatation-unit 1100 may support (e.g. partially support) a weight (e.g. a fraction of a weight) of the second support-floatation-unit(s) of the at least two support-floatation-units 1100 (e.g. when the floatation assembly 1000 is deployed on a water body). As an example, according to various embodiments, the primary connection portion 1150 of a first (or at least one) support-floatation-unit 1100 of the at least two support-floatation-units 1100 may be positioned or arranged beneath (or stacked below) the primary connection portion 1550 of a second (or remainder) support-floatation-unit(s) of the at least two support-floatation-units 1100.

[00084] Further, according to various embodiments, when the at least two support-floatation-units 1100 are coupled together in a manner so as to cross over or intersect each other, the overlapping rigid connection 1800 may be connected to the at least two support-

floatation-units 1100 via at least four force transmission paths or routes, between the overlapping rigid connection 1800 and the at least two support-floatation-units 1100. The at least four force transmission paths or routes may be spaced equidistance apart from each other around the overlapping rigid connection 1800 (e.g. along and intersecting a perimeter or circumference of the overlapping rigid connection 1800). Accordingly, when an external force is applied on either one of the overlapping rigid connection 1800 or at least one respective longitudinal end region(s) of the at least two support-floatation-units 1100, the force may be transmitted between the overlapping rigid connection 1800 and the respective longitudinal end region(s) via a corresponding force transmission path(s) or route(s). According to various embodiments, when the floatation assembly 1000 includes four force transmission paths or routes, the four force transmission paths may be at right angles (e.g. arranged perpendicularly) with respect to each other (in other words, with respect to a neighboring force transmission path or route) about the overlapping rigid connection 1800.

[00085] According to various embodiments, each support-floatation-unit 1100 of the at least two support-floatation-units 1100 may include a first floatation segment 1110, 1510 and a second floatation segment 1130, 1530. Each of the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530, of each support-floatation-unit 1100 of the at least two support-floatation-units 1100, may be a buoyant structure. According to various embodiments, for each support-floatation-unit 1100 of the at least two support-floatation-units 1100, a buoyancy of the first floatation segment 1110, 1510 may be equal to (e.g. identical or substantially equal to) a buoyancy of the second floatation segment 1130, 1530. According to various embodiments, for each support-floatation-unit 1100 of the at least two support-floatation-units 1100, a height or thickness of the first floatation segment 1110, 1510 (between a base surface 1110a, 1510a and a roof surface 1100b, 1510b of the first floatation segment 1110, 1510) may be equal to (e.g. identical or substantially equal to) a height or thickness of the second floatation segment 1130, 1530 (between a base surface 1130a, 1530a and a roof surface 1130b, 1530b of the second floatation segment 1130, 1530). Accordingly, according to various embodiments, each of the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530, of each support-floatation-unit 1100, may serve as a float for evenly supporting an equal portion or weight of the unitary structure 90 (e.g. afloat on a water body).

[00086] According to various embodiments, the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530, of each support-floatation-unit 1100 of the at

least two support-floatation-units 1100, may be respectively adjoined to edges (e.g. side edges) of a corresponding primary connection portion 1150, 1550 of the support-floatation-unit 1100 in a manner such that the primary connection portion 1150, 1550 interconnects the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530. According to various embodiments, the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530, of each support-floatation-unit 1100, may be respectively adjoined to opposite (e.g. immediately or directly opposite) edges of a corresponding primary connection portion 1150, 1550 of the support-floatation-unit 1100.

[00087] According to various other embodiments, the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530, of each support-floatation-unit 1100, may be respectively adjoined to immediately adjacent edges of a corresponding primary connection portion 1150, 1550 of the support-floatation-unit 1100.

[00088] According to various embodiments, the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530, of each support-floatation-unit 1100 of the at least two support-floatation-units 1100, may be separated or spaced apart from each other (e.g. via a corresponding primary connection portion 1150, 1550) (as shown, for example, in FIG. 2B). In other words, according to various embodiments, the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530, of each support-floatation-unit 1100, may be separated by the primary connection portion 1150, 1550 therebetween in a manner such that the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530 of the support-floatation-unit 1100 are not in contact or in abutment with each other. Accordingly, according to various embodiments, each of the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530, of each support-floatation-unit 1100 of the at least two support-floatation-units 1100, may be an individual or singular buoyant structure which may be adjoined to another individual or singular buoyant structure via a corresponding primary connection portion 1150, 1550.

[00089] According to various other embodiments, the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530, of each support-floatation-unit 1100 of the at least two support-floatation-units 1100, may be directly connected or directly adjoined to each other, for example, via a corresponding connecting region of the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530 of each support-floatation-unit 1100 (as shown, for example, in FIG. 3A). Accordingly, according to various other embodiments, the first floatation segment 1110, 1510, the second floatation segment

1130, 1530 as well as the connecting region, of each support-floatation-unit 1100, may form or may be a single or integral buoyant structure.

[00090] As shown in FIG. 1A and FIG. 1B, each of the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530, of each support-floatation-unit 1100 of the at least two support-floatation-units 1100, may include a channel formation 1113, 1513 extending along a roof surface (e.g. upper surface) 1100b, 1510b, 1130b, 1530b thereof (e.g. towards the primary connection portion 1150, 1550 of the support-floatation-unit 1100), with a channel opening 1115, 1515 at an end of the channel formation 1113, 1513 opening at an edge of the roof surface 1100b, 1510b, 1130b, 1530b (e.g. opening to the primary connection portion 1150, 1550) for directing a liquid to flow along the channel formation 1113, 1513 and out of the roof surface 1100b, 1510b, 1130b, 1530b. According to various other embodiments, each channel formation 1113, 1513 may, additionally or alternatively, include a secondary channel opening (not shown) at an opposite end of the channel formation at a longitudinal end (e.g. at a side wall) of the support-floatation-unit 1100 opposite the channel opening 1115, 1515 (or the primary connection portion 1150, 1550). According to various embodiments, each channel formation 1113, 1513 may include a channel floor 1114 which may slope (e.g. incline downwards from a respective longitudinal end region or a respective middle region of a respective support-floatation-unit 1100) to or towards the channel opening 1115, 1515 (and/or towards the secondary channel opening) so as to enable the liquid to flow along the channel floor 1114 towards the channel opening 1115, 1515 (and/or towards the secondary channel opening).

[00091] According to various embodiments, each channel formation 1113, 1513 may be formed by an inward bend in a corresponding roof surface 1100b, 1510b, 1130b, 1530b.

[00092] According to various embodiments, the primary connection portion 1150, 1550 of each support-floatation-unit 1100 may include at least one drain hole 1350. According to various embodiments, the at least one drain hole 1350 may be, for example, at least one through-hole (e.g. separate from the at least one pin-receiving through-hole 1365 and the primary through-hole 1366) extending across the primary connection portion 1150, 1550. A liquid (i.e. which flows from the channel formation 1113, 1513 onto the primary connection portion 1150, 1550 via the channel opening 1115, 1515) may be drained away from the primary connection portion 1150, 1550 via the at least one drain hole 1350.

[00093] According to various embodiments, the primary connection portion 1150, 1550 of each support-floatation-unit 1100 may include at least one reinforcing ridge (described

in detail later). According to various embodiments, the at least one reinforcing ridge may include, but is not limited to, a gusset or gusset plate. Accordingly, according to various embodiments, the at least one reinforcing ridge may be configured to or may be for strengthening a joint between the primary connection portion 1150, 1550 and a corresponding side wall of the first floatation segment 1110, 1510 / the second floatation segment 1130, 1530, of each support-floatation-unit 1100, which are adjoined to corresponding edges (e.g. opposite edges) of the primary connection portion 1150, 1550.

[00094] FIG. 1E shows a side schematic view of a floating arrangement 1001 which includes the floatation assembly 1000 of FIG. 1A and at least one connecting-floatation-unit 1200, with the at least one connecting-floatation-unit 1200 decoupled from the floatation assembly 1000, according to various embodiments; FIG. 1F shows a side schematic view of the floating arrangement 1001 of FIG. 1E, with the at least one connecting-floatation-unit 1200 coupled to the floatation assembly 1000, according to various embodiments; FIG. 1G shows a side schematic view of a first variant floating arrangement 1001a which includes at least one floatation assembly 1000 coupled to at least two connecting-floatation-units 1200, according to various embodiments; and FIG. 1H shows a side schematic view of a second variant floating arrangement 1001b which includes at least one connecting-floatation-unit 1200 interconnecting at least two floating assemblies 1000, according to various embodiments.

[00095] According to various embodiments, there may be provided the floating arrangement 1001.

[00096] According to various embodiments, the floating arrangement 1001 may include at least one (e.g. one or more) floatation assembly 1000 as described herein. Accordingly, the floating arrangement 1001 may be configured to or may be suitable for supporting the unitary structure 90 afloat (e.g. via the floatation assembly 1000 of the floating arrangement 1001).

[00097] As shown in FIG. 1E and FIG. 1F, the floating arrangement 1001 may include at least one connecting-floatation-unit 1200.

[00098] For convenience of illustration and discussion, the at least one connecting-floatation-unit 1200 may be shown here as one connecting-floatation-unit 1200. However, the present disclosure is not limited to the at least one connecting-floatation-unit 1200 including only one connecting-floatation-unit 1200, and the at least one connecting-floatation-unit 1200 may include two or more connecting-floatation-units 1200.

[00099] According to various embodiments, the at least one connecting-floatation-unit 1200 may include a property of being buoyant. According to various embodiments, each of the at least one connecting-floatation-unit 1200 may include a body (e.g. an elongate body) 1201. Accordingly, the at least one connecting-floatation-unit 1200 may serve as a pathway for or which may support a weight of a human afloat. According to various other embodiments, the at least one connecting-floatation-unit 1200 may support a weight of any other structure or installation afloat and may be used for any other application besides serving as a pathway.

[000100] With reference to FIG. 1E and FIG. 1F, the body (e.g. elongate body) 1201 of each connecting-floatation-unit 1200 may include a first longitudinal end or end region 1202 and a second longitudinal end or end region 1203.

[000101] According to various embodiments, within the floating arrangement 1001, end portions (e.g. respective longitudinal end regions) of the at least two support-floatation-units 1100 may be respectively coupled to the body (e.g. elongate body) 1201 of (each of) the at least one connecting-floatation-unit 1200.

[000102] For example, with reference to FIG. 1F, according to various embodiments, within the floating arrangement 1001, the end portion of one support-floatation-unit 1100 (of at least two support-floatation-units 1100) of the floatation assembly 1000 may be coupled to the first longitudinal end 1202 of the body 1201 of the connecting-floatation-unit 1200. Further, the end portion of another support-floatation-unit 1100 (e.g. another one of the at least two support-floatation-units 1100) of the floatation assembly 1000 may be coupled to the second longitudinal end 1203 of the body 1201 of the connecting-floatation-unit 1200, such that the 1201 body of the connecting-floatation-unit 1200 may be connected across the end portions of the at least two support-floatation-units 1100 of the floatation assembly 1000.

[000103] As another example, with reference to FIG. 1G, according to various other embodiments, within a first variant floating arrangement 1001a, one end portion of one support-floatation-unit 1100 (of at least two support-floatation-units 1100) of the floatation assembly 1000 may be coupled to a segment (e.g. first longitudinal end 1202, second longitudinal end 1203, or a middle region between the first longitudinal end 1202 and the second longitudinal end 1203) along a first body 1201 of a first connecting-floatation-unit 1200. Further, another end portion of another (e.g. remainder) support-floatation-unit 1100 (of the at least two support-floatation-units 1100) of the floatation assembly 1000 may be

coupled to a segment along a second body 1201 of a second connecting-floatation-unit 1200. Further, according to various other embodiments, the first and the second connecting-floatation-units 1200 (i.e. which are connected to the floatation assembly 1000) may be connected to each other so as to be in engagement / abutment with each other or may be spaced apart from each other.

[000104] As yet another example, with reference to FIG. 1H, according to various embodiments, within a second variant floating arrangement 1001b, the floating arrangement 1001 may include two (or at least two) floatation assemblies 1000. The end portion of one of the at least two support-floatation-units 1100 of a first of the two floatation assemblies 1000 may be coupled to a first portion (e.g. the first longitudinal end 1202) of the body 1201 of the at least one connecting-floatation-unit 1200 and the end portion of the at least two support-floatation-units 1100 (e.g. one of the at least two support-floatation-units 1100) of a second of the two floatation assemblies may be coupled to a second portion (e.g. the second longitudinal end 1203) of the body 1201 such that the body 1201 of the at least one connecting-floatation-unit 1200 may interconnect the two floatation assemblies 1000.

[000105] With reference to FIG. 1A and FIG. 1B, each support-floatation-unit 1100 (or each of the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530 of each support-floatation-unit 1100) of the floatation assembly 1000 may include at least one end-connection portion 1386. According to various embodiments, the at least one end-connection portion 1386 of the support-floatation-unit 1100 may include, but is not limited to, a connection lug having an eyehole extending therethrough. According to various embodiments, each of the at least one end-connection portion 1386 may protrude sideways or laterally (e.g. substantially horizontally) from a respective side wall (e.g. substantially vertical wall) 1110c, 1130c, 1510c, 1530c of (e.g. between a respective pair of further side walls of) each support-floatation-unit 1100 (or of each of the first floatation segment 1110, 1510 and the second floatation segment 1130, 1530 of each support-floatation-unit 1100). According to various embodiments, the side wall 1110c, 1130c, 1510c, 1530c (from which the at least one end-connection portion 1386 of the support-floatation-unit 1100 may protrude) and the pair of further side walls (adjacent to the side wall 1110c, 1130c, 1510c, 1530c) may form a “U”-shape.

[000106] According to various other embodiments, the side wall 1110c, 1130c, 1510c, 1530c (from which the at least one end-connection portion 1386 of the support-floatation-

unit 1100 may protrude) may be a chamfered corner wall (i.e. between the pair of further side walls).

[000107] According to various embodiments, the side wall 1110c, 1130c, 1510c, 1530c (from which the at least one end-connection portion 1386 of the support-floatation-unit 1100 may protrude) may be reinforced with at least one reinforcing border which may be in a form of a border wall that may be thicker than other walls of each support-floatation-unit 1100 (e.g. thicker than the pair of further side walls).

[000108] With reference to FIG. 1E and FIG. 1F, each of the at least one connecting-floatation-unit 1200 of the floating arrangement 1001 may include at least one end-connection portion 1206. According to various embodiments, the at least one end-connection portion 1206 of the at least one connecting-floatation-unit 1200 may include, but is not limited to, a connection lug having an eyehole extending therethrough. According to various embodiments, each of the at least one end-connection portion 1206 of the at least one connecting-floatation-unit 1200 may protrude sideways or laterally from a respective side wall of (e.g. between a respective pair of further side walls of) the at least one connecting-floatation-unit 1200. According to various embodiments, the side wall (from which the at least one end-connection portion 1206 of the at least one connecting-floatation-unit 1200 may protrude) and the pair of further side walls may form a “U”-shape.

[000109] According to various other embodiments, the side wall (from which the at least one end-connection portion 1206 of the at least one connecting-floatation-unit 1200 may protrude) may be a chamfered corner wall (i.e. between the pair of further side walls).

[000110] Accordingly, according to various embodiments, the at least one end-connection portion 1386 (e.g. connection lug) of the at least two support-floatation-unit(s) 1100) may be respectively placed together with the at least one end-connection portion 1206 (e.g. connection lug) of the at least one connecting-floatation-unit 1200 so as to connect or couple the at least two support-floatation-units 1100 and the at least one connecting-floatation-unit 1200 together (e.g. via a nut and bolt assembly across aligned eyeholes of respective connection lugs 1386, 1206).

[000111] According to various embodiments, when the at least one end-connection portion 1386 of the support-floatation-unit 1100 protrudes from a corresponding chamfered corner wall of the support-floatation-unit 1100 and when the at least one end-connection portion 1206 of the at least one connecting-floatation-unit 1200 protrudes from a corresponding chamfered corner wall of the at least one connecting-floatation-unit 1200, the

at least one end-connection portion 1386 of the at least two support-floatation-units 1100 may be placed together with the at least one end-connection portion 1206 of the at least one connecting-floatation-unit 1200 to connect the at least two support-floatation-units 1100 and the at least one connecting-floatation-unit 1200 together, whereby one of the pair of further side walls of each of the at least two support-floatation-units 1100 may abut or may be spaced apart by a small gap from one of the pair of further side walls of the at least one connecting-floatation-unit 1200.

[000112] FIG. 2A shows a top perspective view of a floatation assembly 2000 with at least two support-floatation-units 2100 coupled together in a manner so as to cross over each other, according to various embodiments; FIG. 2B shows an exploded perspective view of the floatation assembly 2000 of FIG. 2A, according to various embodiments; FIG. 2C shows a top view of the floatation assembly 2000 of FIG. 2A, according to various embodiments; FIG. 2D shows a top view of a first support-floatation-unit 2100a and a second support-floatation-unit 2100b of the at least two support-floatation-units 2100 of FIG. 2A, according to various embodiments; FIG. 2E shows a bottom perspective view of the floatation assembly 2000 of FIG. 2A, according to various embodiments; FIG. 2F shows an exploded perspective view of FIG. 2E, according to various embodiments; FIG. 2G shows a bottom view of the floatation assembly 2000 of FIG. 2A, according to various embodiments; and FIG. 2H shows a bottom view of the first support-floatation-unit 2100a and the second support-floatation-unit 2100b of FIG. 2A, according to various embodiments.

[000113] According to various embodiments, there may be provided the floatation assembly 2000.

[000114] According to various embodiments, the floatation assembly 2000 may contain any or all the features and/or limitations of the floatation assembly 1000 of FIG. 1A and FIG. 1B. In the following, the floatation assembly 2000 is described with like reference characters generally referring to the same or corresponding parts/features of the floatation assembly 1000 of FIG. 1A and FIG. 1B. The description of the parts/features made with respect to the floatation assembly 2000 may be applicable with respect to the floatation assembly 1000, and vice versa.

[000115] Accordingly, according to various embodiments, the floatation assembly 2000 may be configured to or may be suitable for supporting a unitary structure afloat a body of water (e.g. out at sea or dam or river or pond etc.). The unitary structure may include, but not limited to, a solar panel, solar power generation system, a solar power station etc., or

any other structure or installation for any other suitable application, for example, wind turbine, aerator, pump or fish cage etc. Further, according to various embodiments, the unitary structure may be releasably attachable to the floatation assembly.

[000116] According to various embodiments, the floatation assembly 2000 may, similar to the floatation assembly 1000 of FIG. 1A and FIG. 1B, include the at least two support-floatation-units 2100. As shown, the at least two support-floatation-units 2100 may include the first support-floatation-unit 2100a and the second support-floatation-unit 2100b.

[000117] For convenience of illustration and discussion, the at least two support-floatation-units 2100 of the floatation assembly 2000 may be shown here as the first support-floatation-unit 2100a and the second support-floatation-unit 2100b. However, the present disclosure is not limited to the at least two support-floatation-units 2100 of the floatation assembly 2000 including only the first support-floatation-unit 2100a and the second support-floatation-unit 2100b, and the floatation assembly 2000 may include a third or more support-floatation-unit(s).

[000118] As shown, according to various embodiments, each of the first support-floatation-unit 2100a and the second support-floatation-unit 2100b may be of a non-symmetrical “S” shape or “Z” shape.

[000119] With reference to FIG. 2B, each of the first support-floatation-unit 2100a and the second support-floatation-unit 2100b may, similar to the at least two support-floatation-units 1100 of the floatation assembly 1000 of FIG. 1A and FIG. 1B, include a primary connection portion 2150, 2550. As shown, according to various embodiments, each primary connection portion 2150, 2550 may be respectively positioned at a middle (e.g. middle point or middle region) of each of the first support-floatation-unit 2100a and the second support-floatation unit 2100b.

[000120] FIG. 2I shows a close-up top perspective view of the primary connection portion 2150 of the first support-floatation-unit 2100a, according to various embodiments; FIG. 2J shows a close-up bottom perspective view of the primary connection portion 2150 of the first support-floatation-unit 2100a, according to various embodiments; FIG. 2K shows a close-up top perspective view of the primary connection portion 2550 of the second support-floatation-unit 2100b, according to various embodiments; and FIG. 2L shows a close-up bottom perspective view of the primary connection portion 2550 of the second support-floatation-unit 2100b, according to various embodiments.

[000121] With reference to FIG. 2I to FIG. 2L, according to various embodiments, the primary connection portion 2150, 2550 of each of the first support-floatation-unit 2100a and the second support-floatation-unit 2100b may include a connection plate 2152, 2552. As shown, each connection plate 2152, 2552 may include a quadrilateral shape which may include, for example, a square, a rectangle etc. As shown, each connection plate 2152, 2552 may include a corresponding abutment surface 2153, 2553 (e.g. inward facing surface) and a corresponding outward facing surface (e.g. outward facing planar surface) 2154, 2554 opposite the abutment surface 2153, 2553. According to various embodiments, the abutment surface 2153, 2553 and the outward facing surface 2154, 2554 of each connection plate 2152, 2552 may be, but is not limited to being, parallel with each other.

[000122] FIG. 2M shows a top perspective view of an overlapping rigid connection 2800, according to various embodiments; and FIG. 2N shows a bottom perspective view of the overlapping rigid connection 2800, according to various embodiments.

[000123] With reference to FIG. 2M and FIG. 2N, according to various embodiments, the primary connection portions 2150, 2550 of the first support-floatation-unit 2100a and the second support-floatation-unit 2100b of the floatation assembly 2000 may, similar to the floatation assembly 1000 of FIG. 1A and FIG. 1B, be coupled together to form the overlapping rigid connection 2800 so as to be free of relative movement between the at least two support-floatation-units 2100. In particular, according to various embodiments, the primary connection portions 2150, 2550 of the first and the second support-floatation-units 2100a, 2100b may be coupled together to form the overlapping rigid connection 2800 in a manner so as to overlap or stack the connection plates 2152, 2552 of the primary connection portions 2150, 2550 of the first and the second support-floatation-units 2100a, 2100b, with the abutment surfaces 2153, 2553 thereof respectively directed towards each other (in other words, facing each other, and either contacting each other or having a small gap or space between each other).

[000124] According to various embodiments, each connection plate 2152, 2552, of respective primary connection portions 2150, 2550, may include a primary through-hole 2366 extending between the abutment surface 2153, 2553 and the outward facing surface 2154, 2554 thereof. Accordingly, when the overlapping rigid connection 2800 is formed, the primary through-holes 2366 (e.g. hole axes of the primary through-holes 2366) of the primary connection portions 2150, 2550 of the first and the second support-floatation-units 2100a, 2100b may be aligned with each other.

[000125] According to various embodiments, the primary through-hole 2366 of each primary connection portion 2150, 2550 of each support-floatation-unit 2100a, 2100b may be arranged or disposed at a centroid or center of the primary connection portion 2150, 2550 such that a hole-axis of the primary through-hole 2366 may be coaxial or may coincide or may rest or extend along the axial axis of the primary connection portion 2150, 2550.

[000126] According to various embodiments, a bolt (not shown) may be inserted through aligned primary through-holes 2366 of the connection plates 2152, 2552 of the primary connection portions 2150, 2550 of the first and the second support-floatation-units 2100a, 2100b. Further, according to various embodiments, a nut (not shown) may be in engagement with the bolt to lock the connection plates 2152, 2552 of the primary connection portions 2150, 2550 of the first and the second support-floatation-units 2100a, 2100b together, with a head of the bolt and the nut respectively bearing against (e.g. directly bearing against or with a component, e.g. washer, therebetween) the outward facing surfaces 2154, 2554 of the connection plates 2152, 2552 of the primary connection portions 2150, 2550 of the first and the second support-floatation-units 2100a, 2100b.

[000127] According to various embodiments, each of the first and the second support-floatation-units 2100a, 2100b of the floatation assembly 2000 may, similar to the at least two support-floatation-units 1100 of the floatation assembly 1000 of FIG. 1A and FIG. 1B, include a first floatation segment 2110, 2510 and a second floatation segment 2130, 2530. Each of the first floatation segment 2110, 2510 and the second floatation segment 2130, 2530, of each support-floatation-unit 2100a, 2100b may be a buoyant structure.

[000128] FIG. 2O shows a side view of the floatation assembly 2000 of FIG. 2A viewed from a lateral end of the first and the second support-floatation-units 2100a, 2100b, according to various embodiments.

[000129] With reference to FIG. 2O, according to various embodiments, a base surface 2110a, 2130a, 2510a, 2530a of each of the first floatation segment 2110, 2510 and the second floatation segment 2130, 2530 (in other words, a base surface 2110a, 2130a, 2510a, 2530a of each of the first and the second support-floatation-units 2100a, 2100b) may include a curved surface or curved corner 2110f, 2130f, 2510f, 2530f slopping from a lowest point on the base surface 2110a, 2130a, 2510a, 2530a (e.g. a point on a level or horizontal part of the base surface 2110a, 2130a, 2510a, 2530a) towards (e.g. upwards) a roof surface 2110b, 2130b, 2510b, 2530b of the floatation segment 2110, 2510, 2130, 2530 (or support-floatation-unit 2100a, 2100b) so as to end or terminate at a longitudinal edge or tip of the

floatation segment 2110, 2510, 2130, 2530 (or support-floatation-unit 2100a, 2100b). Accordingly, according to various embodiments, each floatation segment 2110, 2510, 2130, 2530 (or each support-floatation-unit 2100a, 2100b) may include the base surface 2110a, 2130a, 2510a, 2530a having a slope or a curved corner 2110f, 2130f, 2510f, 2530f at a respective longitudinal end region of the floatation segment (or support-floatation-unit).

[000130] With reference to FIG. 2I to FIG. 2L, according to various embodiments, the first and the second floatation segments 2110, 2510, 2130, 2530, of each of the first and the second support-floatation-units 2100a, 2100b of the floatation assembly 2000, may be respectively adjoined to opposite edges 2151, 2551 of the connection plate 2152, 2552 thereof. Accordingly, according to various embodiments, the first and the second floatation segments 2110, 2510, 2130, 2530, of each of the first and the second support-floatation-units 2100a, 2100b of the floatation assembly 2000, may be spaced apart or separated from each other with a corresponding connection plate 2152, 2552 therebetween. As shown, the opposite edges 2151, 2551 of the connection plate 2152, 2552 (i.e. to which the first and the second floatation segments 2110, 2510, 2130, 2530 may be respectively adjoined) may be parallel with each other. Accordingly, the first and the second floatation segments 2110, 2510, 2130, 2530, of each of the first and the second support-floatation-units 2100a, 2100b of the floatation assembly 2000, may be extending from the connection plate 2152, 2552 thereof along a same axis or direction extending perpendicularly between the opposite edges 2151, 2551 of the connection plate 2152, 2552.

[000131] According to various embodiments, for each of the first and the second support-floatation-units 2100a, 2100b, a height or thickness of the first floatation segment 2110, 2510 may be equal to a height or thickness of the second floatation segment 2130, 2530.

[000132] According to various embodiments, for each of the first and the second support-floatation-units 2100a, 2100b, a thickness of the connection plate 2152, 2552 (between the abutment surface 2153, 2553 and the outward facing surface 2154, 2554 thereof) may be shorter or thinner than the height or thickness of each of the first and the second floatation segments 2110, 2510, 2130, 2530.

[000133] With reference to FIG. 2B, according to various embodiments, the connection plate 2152 of the first support-floatation-unit 2100a may be positioned on a lower-half region of the first support-floatation-unit 2100a. For example, as shown, according to various embodiments, the outward facing surface 2154 of the connection plate 2152 of the first support-floatation-unit 2100a may be spaced axially apart from the base surface 2110a,

2130a of each of the first and the second floatation segments 2110, 2130 of the first support-floatation-unit 2100a, at the lower-half region of the first support-floatation-unit 2100a.

[000134] As another example (not shown), according to various other embodiments, the outward facing surface 2154 of the connection plate 2152 of the first support-floatation-unit 2100a may be substantially flush or level with a base surface 2110a, 2130a of each of the first and the second floatation segments 2110, 2130 of the first support-floatation-unit 2100a.

[000135] Accordingly, according to various embodiments, opposing (e.g. immediately opposing) side walls 2155 of the first and the second floatation segments 2110, 2130, of the first support-floatation-unit 2100a, respectively extending from and adjoined to the opposite edges 2151 of the connection plate 2152 (to which the first and the second floatation segments 2110, 2130 may be respectively adjoined), may together with the abutment surface 2153 of the connection plate 2152 form a first bracket or slot (e.g. “U”-shaped bracket or slot).

[000136] Further, according to various embodiments, the connection plate 2552 of the second support-floatation-unit 2100b may be positioned on an upper-half region of the second support-floatation-unit 2100b. For example, as shown, according to various embodiments, the outward facing surface 2554 of the connection plate 2552 of the second support-floatation-unit 2100b may be spaced axially apart from the roof surface 2510b, 2530b of each of the first and the second floatation segments 2510, 2530 of the second support-floatation-unit 2100b, at the upper-half region of the second support-floatation-unit 2100b.

[000137] As another example (not shown), according to various other embodiments, the outward facing surface 2554 of the connection plate 2552 of the second support-floatation-unit 2100b may be substantially flush or level with the roof surface 2510b, 2530b of each of the first and the second floatation segments 2510, 2530 of the second support-floatation-unit 2100b.

[000138] Accordingly, according to various embodiments, opposing (e.g. immediately opposing) side walls 2555 of the first and the second floatation segments 2510, 2530, of the second support-floatation-unit 2100b, respectively extending from and adjoined to the opposite edges 2551 of the connection plate 2552 (to which the first and the second floatation segments 2510, 2530 may be respectively adjoined), may together with the

abutment surface 2553 of the connection plate 2552 form a second bracket or slot (e.g. “U”-shaped bracket or slot).

[000139] According to various embodiments, the first bracket or slot may be interlocked or interconnected or coupled with the second bracket or slot to form the overlapping rigid connection 2800 between the connection plates 2152, 2552 of the first and the second support-floatation-units 2100a, 2100b. According to various embodiments, the first bracket or slot and the second bracket or slot may together form a cross lap joint which may secure the first and the second support-floatation-units 2100a, 2100b together in a manner so as to be free of relative movement (e.g. rotational movement) between the first and the second support-floatation-units 2100a, 2100b. Accordingly, according to various embodiments, the first and the second support-floatation-units 2100a, 2100b may be coupled together in a manner so as to cross over or intersect each other (e.g. by way of a cross lap joint) about the overlapping rigid connection 2800. According to various embodiments, within the intersecting arrangement of the first and the second support-floatation-units 2100a, 2100b, the first support-floatation-unit 2100a may be positioned or arranged beneath (or stacked below) a second support-floatation-unit 2100b such that the first support-floatation-unit 2100a may support (e.g. partially supports) a weight (e.g. a fraction of an entire weight) of the second support-floatation-unit 2100b (e.g. when the floatation assembly 1000 is deployed on a water body). According to various embodiments, the primary connection portion 2150 of the first support-floatation-unit 2100a may be positioned or arranged beneath (or stacked below) the primary connection portion 2550 of the second support-floatation-unit 2100b.

[000140] According to various embodiments, each side wall of the opposing side walls 2155, 2555 of the first and the second floatation segments 2110, 2510, 2130, 2530 (respectively adjoined to the opposite edges 2151, 2551 of the connection plate 2152, 2552), of the first and the second support-floatation-units 2100a, 2100b, may include a rounded or curved or bevelled side edge or corner 2117, 2317 (e.g. vertically extending edge or corner, e.g. perpendicular to the abutment surface 2153, 2553 of a corresponding connection plate 2152, 2552). The rounded or curved or bevelled side edge or corner 2117, 2317 may minimize or eliminate stress concentration points on the first and the second floatation segments 2110, 2510, 2130, 2530 and/or may improve manufacturability (e.g. via an injection molding process) of the first and the second floatation segments 2110, 2510, 2130, 2530.

[000141] FIG. 2R shows a close-up perspective view of a pin structure 2360 of each of the first support-floatation-unit 2100a and the second support-floatation-unit 2100b of the floatation assembly 2000, according to various embodiments.

[000142] With reference to FIG. 2I to FIG. 2L and FIG. 2R, the primary connection portion 2150, 2550 (e.g. connection plate 2152, 2552) of each of the first support-floatation-unit 2100a and the second support-floatation-unit 2100b of the floatation assembly 2000 may, similar to the at least two support-floatation-units 1100 of the floatation assembly 1000 of FIG. 1A and FIG. 1B, include at least one pin structure 2360 and/or at least one pin-receiving through-hole 2365. Accordingly, according to various embodiments, for each primary connection portion 2150, 2550 (e.g. each connection plate 2152, 2552) of each of the first support-floatation-unit 2100a and the second support-floatation-unit 2100b of the floatation assembly 2000, the at least one pin structure 2360 may extend perpendicularly away from the abutment surface 2153, 2553 of the connection plate 2152, 2552 thereof, and/or the at least one pin-receiving through-hole 2365 may extend through the connection plate 2152, 2552 thereof. According to various embodiments, the primary connection portions 2150, 2550 of the at least two support-floatation-units 2100 may be coupled together to form the overlapping rigid connection 2800 with the at least one pin structure 2360 of the connection plate 2152 of the primary connection portion 2150 of a first 2100a of the at least two support-floatation-units 2100 inserted through the at least one pin-receiving through-hole 2365 of the connection plate 2552 of the primary connection portion 2550 of a second 2100b of the at least two support-floatation-units 2100 and the at least one pin structure 2360 of the connection plate 2552 of the primary connection portion 2550 of the second 2100b of the at least two support-floatation-units 2100 inserted through the at least one pin-receiving through-hole 2360 of the connection plate 2152 of the primary connection portion 2150 of the first 2100a of the at least two support-floatation-units 2100.

[000143] As shown, the primary connection portion 2150, 2550 of each of the first support-floatation-unit 2100a and the second support-floatation-unit 2100b of the at least two support-floatation-units 2100 may include at least two (or at least a pair of, or two or more) pin structures 2360 and at least two (or at least a pair of, or two or more) pin-receiving through-holes 2365, which may be arranged in an alternating manner around a respective primary through-hole 2366 of the primary connection portion 2150, 2550 (or around an axial axis 80, see FIG. 2B, of the primary through-hole 2366 / overlapping rigid connection 2800). As shown, according to various embodiments, two (or a pair of) pin structures 2360 may

oppose each other from a pair of opposite (e.g. immediately opposite) sides of a corresponding primary through-hole 2366. Further, as shown, according to various embodiments, two (or a pair of) pin-receiving through-holes 2365 may be positioned or disposed directly opposite each other from another pair of opposite (e.g. immediately opposite) sides of the corresponding primary through-hole 2366 such that the corresponding primary through-hole 2366 may be positioned between two pin-receiving through-holes 2365.

[000144] According to various embodiments, each pin structure 2360 of the primary connection portion 2150, 2550 (e.g. connection plate 2152, 2552) of each of the first and the second support-floatation-units 2100a, 2100b of the floatation assembly 2000 may, similar to the at least one pin structure 1360 of the floatation assembly 1000 of FIG. 1A and FIG. 1B, include a split end portion 2362 which may form at least two cantilever members 2363. According to various embodiments, the at least two cantilever members 2363 may be extending from the abutment surface 2153, 2553 of the connection plate 2152, 2552 of the primary connection portion 2150, 2550 of each of the first and the second support-floatation-units 2100a, 2100b. As shown in FIG. 2I and FIG. 2L, according to various embodiments, the at least two cantilever members 2363 of each pin structure 2360 may be joined to a corresponding base portion 2361 (e.g. a stem) of the pin structure 2360.

[000145] With reference to FIG. 2I and FIG. 2L, according to various embodiments, the base portion 2361 of each pin structure 2360 may include an uninterrupted segment (in other words, free from or without any split end portion 2362) of the pin structure 2360 extending from the abutment surface 2153, 2553 of the primary connection portion 2150, 2550 to a height away from the abutment surface 2153, 2553. According to various embodiments, the height of the base portion 2361 may be equal (e.g. substantially equal) to or less than (e.g. three quarters, half, or less than half of) a thickness of a corresponding primary connection portion 2150, 2550 (e.g. measured between the abutment surface 2153, 2553 and the outward facing surface 2154, 2554 thereof).

[000146] According to various embodiments, the at least two cantilever members 2363 of each pin structure 2360 may be spaced equidistance apart from each other (e.g. about a center of the pin structure 2360 or about the base portion 2361 of the pin structure 2360). For example, when the at least two cantilever members 2363 includes only two cantilever members 2363, the two cantilever members 2363 may be positioned immediately opposite each other (in other words, 180 degrees apart) about a center of the pin structure 2360 or

about the base portion 2361 of the pin structure 2360. According to various embodiments, each of the at least two cantilever members 2363 of each pin structure 2360 may be extending non-perpendicularly with respect to the abutment surface 2153, 2553 of the connection plate 2152, 2552 of the primary connection portion 2150, 2550 of each of the first and the second support-floatation-units 2100a, 2100b, and in a radially outward direction away from the center of the pin structure 2360. In other words, according to various embodiments, each pin structure 2360 may taper inwards from a tip or free end of the pin structure 2360 towards a base of the pin structure 2360 adjoining the abutment surface 2153, 2553 of the connection plate 2152, 2552, such that a width of the tip / free end of the pin structure 2360 (e.g. a width between the tips of two furthest apart cantilever members 2363) may be wider than a width of the base of the pin structure 2360.

[000147] According to various embodiments, the at least two cantilever members 2363 of each pin structure 2360 may include a property of being resilient (e.g. relative to a corresponding abutment surface 2153, 2553 or relative to the base portion 2361 of the pin structure). Further, according to various embodiments, each cantilever member 2363 may include an overhang element 2364 protruding sideways or laterally from a tip (e.g. end point or end region) of each cantilever member 2363. According to various other embodiments, each pin structure 2360 (e.g. a tubular pin structure, a columnar pin structure etc.) may include the overhang element 2364 protruding sideways or laterally from a tip of the pin structure 2360 (e.g. a tubular pin structure, a columnar pin structure etc.) without any cantilever member 2363 therealong. According to various embodiments, the overhang elements 2364 of the at least two cantilever members 2363 of each pin structure 2360 may be directed away from each other. Accordingly, according to various embodiments, in operation, the at least two resilient cantilever members 2363 of each pin structure 2360 may be brought towards each other (e.g. by an external force applied radially inwardly on the at least two resilient cantilever members) in a manner such that the pin structure 2360 may be inserted (in other words, fitted) into a corresponding pin-receiving through-hole 2365. Once inserted, the external force may be released such that the overhang elements 2364 may hook or catch or hold onto a rim portion of the corresponding pin-receiving through-hole 2365 by way of the at least two (resilient) cantilever members 2363 returning to their original or initial form.

[000148] With reference to FIG. 2I to FIG. 2L, according to various embodiments, the primary connection portion 2150, 2550 (e.g. connection plate 2152, 2552) of each of the

first and the second support-floatation-units 2100a, 2100b may include a pair of parallel (e.g. substantially parallel) opposing reinforcing walls 2370 extending away from the outward facing surface 2154, 2554 of the primary connection portion 2150, 2550 of the support-floatation-unit 2100a, 2100b. Each pair of parallel opposing reinforcing walls 2370 may be configured to or may be for adding support and/or rigidity to a corresponding primary connection portion 2150, 2550 (e.g. to minimize or prevent the primary connection portion 2150, 2550 from warping or bending). According to various embodiments, each of the pair of parallel opposing reinforcing walls 2370, of each of the first and the second support-floatation-units 2100a, 2100b, may be extending perpendicularly from the outward facing surface 2154, 2554 of the connection plate 2152, 2552 of the primary connection portion 2150, 2550 of the support-floatation-unit 2100a, 2100b. According to various embodiments, the pair of parallel opposing reinforcing walls 2370, of each of the first and the second support-floatation-units 2100a, 2100b, may be respectively positioned at a pair of opposite side edges or side regions 2156, 2556 of the connection plate 2152, 2552 of the support-floatation-unit 2100a, 2100b. Further, according to various embodiments, each pair of parallel opposing reinforcing walls 2370 may be extending between the opposing, e.g. immediately opposing, side walls 2155, 2555 of the first and the second floatation segments 2110, 2510, 2130, 2530 (i.e. adjoined to the opposite edges 2151, 2551 of the connection plate 2152, 2552) of each support-floatation-unit 2100a, 2100b.

[000149] According to various embodiments, each of the pair of parallel opposing reinforcing walls 2370, of each of the first and the second support-floatation-units 2100a, 2100b, may be adjoined to or abutting the outward facing surface 2154, 2554 of the connection plate 2152, 2552 of the support-floatation-unit 2100a, 2100b and adjoined to or abutting the opposing side walls 2155, 2555 of the first and the second floatation segments 2110, 2510, 2130, 2530 (i.e. adjoined to the opposite edges 2151, 2551 of the connection plate 2152, 2552) of the support-floatation-unit 2100a, 2100b. Accordingly, according to various embodiments, each of the pair of parallel opposing reinforcing walls 2370 may be respectively running along an entire extend across a corresponding region of the connection plate 2152, 2552 of the support-floatation-unit 2100a, 2100b.

[000150] According to various embodiments, when the connection plate 2152, 2552 of each of the first and the second support-floatation-units 2100a, 2100b includes the primary through-hole 2366, the pair of parallel opposing reinforcing walls 2370 of each of the first and the second support-floatation-units 2100a, 2100b may be respectively positioned on two

opposite sides (e.g. lateral sides) of a corresponding primary through-hole 2366 of the connection plate 2152, 2552.

[000151] With reference to FIG. 2I to FIG. 2L, according to various embodiments, each or both of the pair of parallel opposing reinforcing walls 2370, of each of the first and the second support-floatation-units 2100a, 2100b, may be a single layer wall (not shown) or a double layer wall 2370a.

[000152] As shown, according to various embodiments, when each of the pair of parallel opposing reinforcing walls 2370 is the double layer wall 2370a, the double layer wall 2370a may include a pair of spaced apart parallel first and second wall layers 2371, 2372. According to various embodiments, the double layer wall 2370a may include a roof layer 2373 suspended across the pair of spaced apart parallel first and second wall layers 2371, 2372. Accordingly, according to various embodiments, the roof layer 2373 may be adjoined to the pair of spaced apart parallel first and second wall layers 2371, 2372. As shown, according to various embodiments, the roof layer 2373 of the double layer wall 2370a, of the first support-floatation-unit 2100a, may be adjoined to and/or may be flushed or level with the base surface of the first support-floatation-unit 2100a (e.g. the base surface 2110a, 2130a, 2510a, 2530a of each of the first and the second floatation segments 2110, 2510, 2130, 2530 of the first support-floatation-unit 2100a). Further, according to various embodiments, the roof layer 2373 of the double layer wall 2370a, of the second support-floatation-unit 2100b, may be adjoined to and/or may be flushed or level with the roof surface of the second support-floatation-unit 2100b (e.g. the roof surface 2110b, 2130b, 2510b, 2530b of each of the first and the second floatation segments 2110, 2510, 2130, 2530 of the second support-floatation-unit).

[000153] According to various embodiments, when each of the pair of parallel opposing reinforcing walls 2370 is the double layer wall 2370a, the double layer wall 2370a may include a plurality of strengthening structures 2374 distributed along the double layer wall 2370a lengthwise (in other words, distributed along a direction extending between the opposing side walls 2155, 2555 of the first and the second floatation segments 2110, 2510, 2130, 2530 adjoined to the opposite edges 2151, 2551 of the connection plate 2152, 2552). The plurality of strengthening structures 2374 may be configured to or may be for adding support and/or rigidity to the double layer wall 2370a (e.g. to minimize or prevent the double layer wall 2370a from warping or bending).

[000154] According to various embodiments, each strengthening structure 2374 may extend between the pair of spaced apart parallel first and second wall layers 2371, 2372 and across the roof layer 2373. For example, according to various embodiments, the plurality of strengthening structures 2374 may include a plurality of strengthening ribs or ridges 2375, each strengthening rib or ridge 2375 extending from a base of a first wall layer 2371 of the double layer wall 2370a height-wise to a top of the first wall layer 2371, across the roof layer 2373 from the top of the first wall layer 2371 to a top of a second wall layer 2372 of the double layer, and from the top of the second wall layer 2372 height-wise to a base of the second wall layer 2372.

[000155] In another example, according to various other embodiments, the plurality of strengthening structures 2374 may include a plurality of strengthening partition walls (not shown). Each strengthening partition wall may extend perpendicularly across the pair of spaced apart parallel first and second wall layers 2371, 2372 of the double layer wall 2370a so as to be across the roof layer 2373.

[000156] As shown in FIG. 2J and FIG. 2K, according to various embodiments, the primary connection portion 2150, 2550 (e.g. connection plate 2152, 2552), of each of the first and the second support-floatation-units 2100a, 2100b, may include at least one reinforcing ridge 2376 configured to or for strengthening a joint between the primary connection portion 2150, 2550 and a corresponding side wall of the opposing side walls 2155, 2555 of the first and the second floatation segments 2110, 2510, 2130, 2530 of the support-floatation-unit 2100a, 2100b. As shown, according to various embodiments, the at least one reinforcing ridge 2376 may include or may be, but is not limited to, a gusset or gusset plate. According to various embodiments, for each of the first and the second support-floatation-units 2100a, 2100b, the at least one reinforcing ridge 2376 may be adjoined to (e.g. only to) both (i) a corresponding primary connection portion 2150, 2550 (e.g. to an outward facing surface 2154, 2554 of a corresponding connection plate 2152, 2552) and (ii) a corresponding side wall of the opposing side walls 2155, 2555 of the first and the second floatation segments 2110, 2510, 2130, 2530 (i.e. which are respectively adjoined to the opposite edges 2151, 2551 of the connection plate 2152, 2552) of the support-floatation-unit 2100a, 2100b. Further, according to various embodiments, the at least one reinforcing ridge 2376 may be extending perpendicularly (e.g. substantially perpendicularly) from the outward facing surface 2154, 2554 of the corresponding connection plate 2152, 2552 of the corresponding primary connection portion 2150, 2550 of the first and the second support-

floatation-units 2100a, 2100b. According to various embodiments, each of the at least one reinforcing ridge 2376 of the primary connection portion 2150 of the first support-floatation-unit 2100a may be parallel with each other. Further, according to various embodiments, each of the at least one reinforcing ridge 2376 of the primary connection portion 2550 of the second support-floatation-unit 2100b may be parallel with each other.

[000157] According to various embodiments, each connection plate 2152, 2552 of each primary connection portion 2150, 2550 may include at least two (e.g. a pair or more pairs of) reinforcing ridges 2376 extending from the outward facing surface 2154, 2554 of the connection plate 2152, 2552 thereof. The at least two (e.g. a pair or more pairs of) reinforcing ridges 2376 may be opposing each other on the corresponding connection plate 2152, 2552. According to various embodiments, two (e.g. a pair of) reinforcing ridges 2376 of the at least two (e.g. a pair or more pairs of) reinforcing ridges 2376 may be respectively aligned to two opposite radial directions extending from a center of the primary through-hole 2366 of the corresponding connection plate 2152, 2552 along the outward facing surface 2154, 2554 thereof.

[000158] According to various embodiments, when the primary connection portion 2150, 2550 includes the pair of parallel opposing reinforcing walls 2370, the two opposite radial directions may be parallel to the pair of parallel opposing reinforcing walls 2370.

[000159] According to various embodiments, each of the at least one reinforcing ridge 2376 may include a triangular shape (e.g. a right triangle), a quadrilateral shape (e.g. with an unconnected/exposed corner being rounded or bevelled), or any other suitable shape.

[000160] According to various embodiments, when the at least one reinforcing ridge 2376 includes two or more reinforcing ridges 2376, a width of at least one reinforcing ridge 2376 (e.g. measured across a lateral axis of the reinforcing ridge 2376) may be equal to or may be different from a width of another (e.g. remainder) reinforcing ridge(s) 2376.

[000161] According to various embodiments, any one or more of the at least one reinforcing ridge 2376 may include a uniform cross-section across a lateral axis of the reinforcing ridge 2376. For example, according to various other embodiments, any one or more of the at least one reinforcing ridge 2376 may include or may be a wedge or wedge structure having the uniform cross-section across the lateral axis.

[000162] According to various other embodiments, any one or more of the at least one reinforcing ridge 2376 may include a non-uniform cross-section across the lateral direction. For example, according to various embodiments, any one or more of the at least one

reinforcing ridge 2376 may include or may be a triangular pyramid (e.g. a right triangular pyramid).

[000163] According to various embodiments, when the at least one reinforcing ridge 2376 includes two or more reinforcing ridges 2376, the reinforcing ridges 2376 may be identical (e.g. in form, shape, size) to each other.

[000164] According to various other embodiments, when the at least one reinforcing ridge 2376 includes two or more reinforcing ridges 2376, the reinforcing ridges 2376 may be different or distinct (e.g. in form, shape, size) from each other

[000165] As an example, with reference to FIG. 2J and FIG. 2K, each primary connection portion 2150, 2550, of each of the first and the second support-floatation-units 2100a, 2100b, may include six reinforcing ridges 2376 (e.g. three pairs of opposing reinforcing ridges 2376), in which three reinforcing ridges 2376 may be disposed on a corresponding side wall of the opposing side walls 2155, 2555 of the first and the second floatation segments 2110, 2510, 2130, 2530 (respectively adjoined to the opposite edges 2151, 2551 of the connection plate 2152, 2552) of the support-floatation-unit 2100a, 2100b. As shown, according to various embodiments, on each side wall of the opposing side walls 2155, 2555 of the first and the second floatation segments 2110, 2510, 2130, 2530 of the support-floatation-unit 2100a, 2100b, a width of one of the three reinforcing ridges 2376, between the other two (or remainder) of the three reinforcing ridges 2376, may be thinner or smaller than a width of each of the other two (or remainder) of the three reinforcing ridges 2376. In other words, according to various embodiments, on each side wall of the opposing side walls 2155, 2555 of the first and the second floatation segments 2110, 2510, 2130, 2530 of the support-floatation-unit 2100a, 2100b, a width (e.g. average width) of a centrally positioned reinforcing ridge 2376 of a plurality of reinforcing ridges 2376 (e.g. the centrally positioned reinforcing ridge 2376 being between at least two or more other or remaining reinforcing ridges 2376 of the plurality of reinforcing ridges 2376) may be thinner or smaller (or different) than a width of each of the at least two or more other or remaining reinforcing ridges 2376. As shown, according to various embodiments, on each side wall of the opposing side walls 2155, 2555 of the first and the second floatation segments 2110, 2510, 2130, 2530 of the support-floatation-unit 2100a, 2100b, the centrally positioned reinforcing ridge 2376 of the plurality of reinforcing ridges 2376 may include or may be a right triangular pyramid, while each of the other (or remaining) reinforcing ridges 2376 (on each side of the right triangular pyramid) may include or may be a wedge structure. As shown,

according to various embodiments, a respective wedge structure on each side of the right triangular pyramid may be adjoined or abutting one reinforcing wall of a corresponding pair of parallel opposing reinforcing walls 2370.

[000166] With reference to FIG. 2I and FIG. 2L, according to various embodiments, each primary connection portion 2150, 2550 may include a web arrangement 2390 positioned around and/or surrounding a corresponding primary through-hole 2366 of the primary connection portion 2150, 2550 along the abutment surface 2153, 2553 and/or the outward facing surface 2154, 2444 thereof. As shown, according to various embodiments, each web arrangement 2390 may include a plurality of linearly extending webs 2390a across the abutment surface 2153, 2553 and/or the outward facing surface 2154, 2444 of a corresponding primary connection portion 2150, 2550, from the primary through-hole 2366 of the corresponding primary connection portion 2150, 2550 and along different radial directions with respect to the primary through-hole 2366. With reference to FIG. 2I and FIG. 2L, according to various embodiments, the web arrangement 2390 may, alternatively or additionally, include a circular web 2390b that surrounds (e.g. completely or entirely surrounds) or encircles the primary through-hole 2366 of the corresponding primary connection portion 2150, 2550. As shown in FIG. 2I and FIG. 2L, according to various embodiments, within a corresponding web arrangement 2390, the plurality of linearly extending webs 2390a may extend radially from the circular web 2390b.

[000167] According to various embodiments, each of the first and the second support-floatation-units 2100a, 2100b may, similar to the at least two support-floatation-units 1100 of the floatation assembly 1000 of FIG. 1A and FIG. 1B, include at least one securing element 2380 distributed along the support-floatation-unit 2100a, 2100b. Accordingly, according to various embodiments, the at least one securing element 2380 may be capable of forming a releasable attachment with the unitary structure. Further, according to various embodiments, the support-floatation-units 2100a, 2100b may be coupled together in a manner so as to provide an arrangement of at least two (e.g. two, three, four etc.) securing elements 2380 distributed (e.g. (i) evenly distributed, for example, when the arrangement includes two or four securing elements, or (ii) unevenly distributed, for example, when the arrangement includes three securing elements) around the overlapping rigid connection 2800 and equidistant from a center of the overlapping rigid connection 2800 configured to or for supporting (e.g. evenly supporting, or unevenly supporting) the unitary structure releasably attachable to the arrangement of at least two securing elements 2380.

[000168] As shown, each support-floatation-unit 2100a, 2100b may include two or at least two securing elements 2380. Thus, for example, as shown, according to various embodiments, the floatation assembly 2000 may include four or at least four securing elements 2380.

[000169] As shown, each securing element 2380 of each support-floatation-unit 2100a, 2100b may be positioned at a respective longitudinal end region of the support-floatation-unit 2100a, 2100b. Accordingly, according to various embodiments, the primary connection portion 2150, 2550 of each support-floatation-unit 2100a, 2100b may be positioned between the securing elements 2380 of the support-floatation-unit 2100a, 2100b.

[000170] FIG. 2P shows a close-up bottom perspective view of the securing element 2380, from a first orientation, according to various embodiments; and FIG. 2Q shows a close-up bottom perspective view of the securing element 2380, from a second orientation, according to various embodiments.

[000171] As shown in FIG. 2P and FIG. 2Q, each securing element 2380 may include or may be a securing plate 2381 with a plurality of securing holes 2382. As shown, according to various embodiments, each securing plate 2381 may have a thickness that may be thinner than a thickness / height of each support-floatation-unit 2100a, 2100b (e.g. each of the first and the second floatation segments 2110, 2510, 2130, 2530 of each support-floatation-unit 2100a, 2100b). Further, according to various embodiments, each securing plate 2381 may include a surface (e.g. upper surface) which may be substantially flush or level with the roof surface 2110b, 2130b, 2510b, 2530b of each support-floatation-unit 2100a, 2100b.

[000172] According to various embodiments, each securing hole 2382 of the plurality of securing holes 2382 may be a through-hole extending across a corresponding securing plate 2381.

[000173] According to various embodiments, a corresponding securing element of the unitary structure may be releasably attachable to each securing plate 2381 having the plurality of securing holes 2382. For example, the unitary structure may be releasably attached to the securing plates 2381 via a corresponding securing element (e.g. bolt and nut, cable etc.) of the unitary structure fastened through or across the plurality of securing holes 2382.

[000174] As shown in FIG. 2C, according to various embodiments, the first and the second support-floatation-units 2100a, 2100b may be coupled together in a manner so as to provide an arrangement, of at least four securing elements 2380 symmetric about at least

two lines of symmetry, configured to or for supporting the unitary structure releasably attachable to the arrangement of at least four securing elements 2380.

[000175] With reference to FIG. 2Q, according to various embodiments, each securing plate 2381 may be reinforced with one or a plurality of reinforcing stripe(s) or ridge(s) 2383 distributed across the securing plate 2381 configured to or for adding support and/or rigidity to the securing plate 2381 (e.g. to minimize or prevent the securing plate 2381 from warping or bending). As shown, the plurality of reinforcing stripes or ridges 2383 of each securing plate 2381 may be extending parallel with one another, along a lateral direction (e.g. along a direction substantially parallel with a lateral axis of the floatation assembly 2000). As shown, according to various embodiments, each reinforcing stripe 2383 may extend continuously along the securing plate 2381 and an inner (or inward facing) surface of one or both side walls, of each support-floatation-unit 2100a, 2100b, extending perpendicularly (e.g. substantially perpendicular with respect to the securing plate 2381) from each side (e.g. lateral side) of the securing plate 2381.

[000176] With reference to FIG. 2B and FIG. 2O, each of the first floatation segment 2110, 2510 and the second floatation segment 2130, 2530, of each of the first and the second support-floatation-units 2100a, 2100b may include a channel formation 2113, 2513 extending along the roof surface 2110b, 2130b, 2510b, 2530b thereof (e.g. towards the primary connection portion 2150, 2550 of the support-floatation-unit 2100a, 2100b), with a channel opening 2115, 2515 at an end of the channel formation 2113, 2513 opening to an edge of the roof surface 2110b, 2130b, 2510b, 2530b (e.g. opening to the primary connection portion 2150, 2550) for directing a liquid to flow along the channel formation 2113, 2513 and out of the roof surface 2110b, 2130b, 2510b, 2530b.

[000177] As shown, each channel formation 2113, 2513 may be formed by an inward bend in the roof surface 2110b, 2130b, 2510b, 2530b of a corresponding support-floatation-unit 2100a, 2100b. According to various embodiments, with the channel formation 2113, 2513 being an inward bend (e.g. an inward groove), the channel formation 2113, 2513 may add support and/or rigidity to the support-floatation-unit 2100a, 2100b (e.g. to the roof surface 2110b, 2130b, 2510b, 2530b of the support-floatation-unit 2100) against bending (e.g. when the roof surface 2110b, 2130b, 2510b, 2530b is supporting or bearing a load thereon).

[000178] According to various embodiments, each channel formation 2113, 2513 may trace a shape of the support-floatation-unit 2100a, 2100b. For example, as shown, according

to various embodiments, each channel formation 2113, 2513 may include a shape of half (e.g. upper or bottom half) of a “S” shape or “Z” shape of the support-floatation-unit 2100a, 2100b.

[000179] According to various embodiments, each channel formation 2113, 2513 may include a channel floor 2114, 2514 that slopes (e.g. downwards) from a longitudinal end (or start) of the channel formation 2113, 2513 towards or to the channel opening 2115, 2515 so as to enable a liquid to flow along the channel floor 2114, 2514 (e.g. from the start) and out from the channel opening 2115, 2515. According to various embodiments, the longitudinal end (or start) of each channel formation 2113, 2513 may be immediately adjacent to a corresponding securing element 2380, of the first and the second support-floatation-units 2100a, 2100b. In other words, each channel formation 2113, 2513 may not interfere with any securing element 2380.

[000180] According to various embodiments, each channel opening 2115, 2515 may be aligned with (e.g. may be immediately adjacent to or may be in fluidic connection with) at least one corresponding reinforcing ridge 2376 (e.g. a right triangular pyramid). For example, according to various embodiments, each channel opening 2115, 2515 may open to or may be adjacent to an apex or tip of a corresponding triangular pyramid of the corresponding reinforcing ridge 2376. Accordingly, a liquid which flows out of the channel formation 2113, 2513 from the channel opening 2115, 2515 may then slide along a pair of inclined or sloping sides surfaces (e.g. exposed surfaces) of a corresponding right triangular pyramid which extends from the apex to a base of the corresponding right triangular pyramid.

[000181] According to various embodiments, the primary connection portion 2150, 2550 of each support-floatation-unit 2100a, 2100b may include at least one drain hole 2350. As shown, each primary connection portion 2150, 2550 may include a plurality of drain holes 2350 arranged around the primary through-hole 2366 of the primary connection portion 2150, 2550. According to various embodiments, at least one drain hole 2350 may be positioned immediately adjacent to (e.g. at a base of) the pair of inclined or sloping sides surfaces (e.g. pair of exposed surfaces) of the corresponding right triangular pyramid of the corresponding reinforcing ridge 2376.

[000182] With reference to FIG. 2B and FIG. 2C, each of the first and the second support-floatation-units 2100a, 2100b (e.g. each of the first floatation segment 2110, 2510 and the second floatation segment 2130, 2530 of each of the first and the second support-floatation-

units 2100a, 2100b) may, similar to the at least two support-floatation-units 1100 of the floatation assembly 1000 of FIG. 1A and FIG. 1B, include at least one end-connection portion 2386. As shown, according to various embodiments, the at least one end-connection portion 2386 may include or may be a connection lug with an eyehole. As shown, according to various embodiments, each of the at least one end-connection portion 2386 may protrude sideways or laterally from a respective chamfered corner wall 2110c, 2130c, 2510c, 2530c between a respective pair of further side walls 2110d, 2130d, 2510d, 2530d of each support-floatation-unit 2100a, 2100b (e.g. each of the first floatation segment 2110, 2510 and the second floatation segment 2130, 2530 of each support-floatation-unit 2100a, 2100b).

[000183] FIG. 2S shows a front view of the floatation assembly 2000 of FIG. 2A viewed from a first longitudinal end of the first and the second support-floatation-units 2100a, 2100b, according to various embodiments.

[000184] With reference to FIG. 2O and FIG. 2S, according to various embodiments, each end-connection portion 2386 on each first floatation segment 2110, 2510, of each of the first and the second support-floatation-units 2100a, 2100b, may be positioned at a first height or distance with respect to the base surface 2400, 2110a, 2130a, 2510a, 2530a of the support-floatation-unit 2100a, 2100b.

[000185] Further, according to various embodiments, each end-connection portion 2386 on each second floatation segment 2130, 2530, of each of the first and the second support-floatation-units 2100a, 2100b, may be positioned at a second height or distance with respect to the base surface 2400, 2110a, 2130a, 2510a, 2530a of the support-floatation-unit 2100a, 2100b.

[000186] As shown, according to various embodiments, the first height may be shorter or smaller than the second height, with respect to the corresponding base surface 2400, 2110a, 2130a, 2510a, 2530a.

[000187] According to various other embodiments, the first height may be equal to or larger than the second height, with respect to the corresponding base surface 2400, 2110a, 2130a, 2510a, 2530a.

[000188] With reference to FIG. 2P and FIG. 2Q, according to various embodiments, the floatation assembly 2000 may include at least one reinforcing border 2388 at and/or along and/or adjoined to a respective wall (e.g. a side wall or a chamfered corner wall) 2110c, 2130c, 2510c, 2530c from which the at least one end-connection portion 2386 protrudes. As shown, the respective chamfered corner wall (e.g. a segment of or the entire length of the

respective chamfered corner wall) 2110c, 2130c, 2510c, 2530c may be reinforced with the at least one reinforcing border 2388. As shown, the at least one reinforcing border 2388 may be in a form of a border wall that may be thicker than one or both of the respective pair of further side walls 2110d, 2130d, 2510d, 2530d immediately adjoined or adjacent to the respective reinforced chamfered corner wall (or side wall) 2110c, 2130c, 2510c, 2530c.

[000189] FIG. 2T shows a top view of a floating arrangement 2001 which includes the floatation assembly 2000 of FIG. 2A and at least one connecting-floatation-unit 2200, according to various embodiments; and FIG. 2U shows a perspective view of the connecting-floatation-unit 2200 of the floating arrangement 2001 of FIG. 2T, according to various embodiments.

[000190] According to various embodiments, there may be provided the floating arrangement 2001.

[000191] According to various embodiments, the floating arrangement 2001 may contain any or all the features and/or limitations of the floating arrangement 1001 of FIG. 1E and FIG. 1F. In the following, the floating arrangement 2001 is described with like reference characters generally referring to the same or corresponding parts/features of the floating arrangement 1001 of FIG. 1E and FIG. 1F. The description of the parts/features made with respect to the floating arrangement 2001 may be applicable with respect to the floating arrangement 1001, and vice versa.

[000192] According to various embodiments, the floating arrangement 2001 may include at least one (e.g. one or more) floatation assembly 1000 and/or at least one (e.g. one or more) floatation assembly 2000 as described herein.

[000193] According to various embodiments, the floating arrangement 2001 may, similar to the floating arrangement 1001 of FIG. 1E and FIG. 1F, include at least one connecting-floatation-unit 2200.

[000194] According to various embodiments, the floating arrangement 2001 may include at least one connecting-floatation-unit 1100 of FIG. 1E and FIG. 1F.

[000195] As shown in FIG. 2U, according to various embodiments, the body (e.g. elongate body) 2201 of the at least one connecting-floatation-unit 2200 may include a first longitudinal end or end region 2202 and a second longitudinal end or end region 2203.

[000196] According to various embodiments, end portions (e.g. respective longitudinal end regions) of the at least two support-floatation-units 2100 may be respectively coupled to the body (e.g. elongate body) 2201 of (each of) the at least one connecting-floatation-unit

2200. For example, according to various embodiments, the end portions of the at least two support-floatation-units 2100 of the floatation assembly 2000 may be respectively coupled to the first longitudinal end or end region 2202 and the second longitudinal end or end region 2203 of the body 2201 of the at least one connecting-floatation-unit 2200 such that the body 2201 of the at least one connecting-floatation-unit 2200 may be connected across the end portions of the at least two support-floatation-units 2100 of the floatation assembly 2000.

[000197] As another example, according to various other embodiments, one end portion of one support-floatation-unit 2100a or 2100b (of the at least two support-floatation-units 2100) of the floatation assembly 2000 may be coupled to a segment (e.g. first longitudinal end 2202, second longitudinal end 2203, or a middle region between the first longitudinal end 2202 and the second longitudinal end 2203) along a first body 1101, 2201 of a first connecting-floatation-unit 1200, 2200. Further, according to various other embodiments, another end portion of another support-floatation-unit 2100a or 2100b (of the at least two support-floatation-units 2100) of the floatation assembly 2000 may be coupled to a segment along a second body 1101, 2201 of a second connecting-floatation-unit 1200, 2200. Further, according to various other embodiments, the first and the second connecting-floatation-units 1200, 2200 (i.e. which are connected to the floatation assembly 2000) may be connected to each other so as to be in engagement / abutment with each other or may be spaced apart from each other.

[000198] With reference to FIG. 2U, the at least one connecting-floatation-unit 2200 of the floating arrangement 2001 may include at least one end-connection portion 2206. As shown, according to various embodiments, the at least one end-connection portion 2206 may include or may be a connection lug with an eyehole. As shown, according to various embodiments, each of the at least one end-connection portion 2206 may protrude sideways or laterally from a respective chamfered corner wall 2201c between a respective pair of further side walls 2201d of the at least one connecting-floatation-unit 2200.

[000199] Accordingly, according to various embodiments, the at least one end-connection portion 2386 (e.g. connection lug) of each of the first and the second support-floatation-units 2100a, 2100b may be placed together with the at least one end-connection portion 2206 (e.g. connection lug) of the at least one connecting-floatation-unit 2200 so as to connect or couple the first and the second support-floatation-units 2100a, 2100b and the at least one connecting-floatation-unit 2200 together.

[000200] With reference to FIG. 2T, according to various embodiments, the floating arrangement 2001 may include a plurality of floatation assemblies 2000 and a plurality of connecting-floatation-units 2200.

[000201] With reference to FIG. 2U, the main body (or elongate main body) 2201 of each connecting-floatation-unit 2200 may include an overhanging protrusion (or longitudinally-directed-overhanging-protrusion) 2242 extending longitudinally outwards or directed away from an upper half of the first longitudinal end 2202 of the main body (or elongate main body) 2201 of the connecting-floatation-unit 2200 and an underside socket (or longitudinally-aligned-underside-socket) 2244 extending inwards at a lower half of the first longitudinal end 2202 of the main body (or elongate main body) 2201 of the connecting-floatation-unit 2200. Further, the main body (or elongate main body) 2201 of each connecting-floatation-unit 2200 may include an upper-side socket (or longitudinally-aligned-upper-side-socket) 2246 extending inwards at an upper half of the second longitudinal end 2203 of the main body (or elongate main body) 2201 of the connecting-floatation-unit 2200 and a foot protrusion (or longitudinally-directed-foot-protrusion) 2248 extending longitudinally from a lower half of the second longitudinal end 2203 of the main body (or elongate main body) 2201 of the connecting-floatation-unit 2200. The underside socket (or longitudinally-aligned-underside-socket) 2244 at the first longitudinal end 2202 may be shaped to correspond with a shape of the foot protrusion (or longitudinally-directed-foot-protrusion) 2248 at the second longitudinal end 2203, and the upper-side socket (or longitudinally-aligned-upper-side-socket) 2246 at the second longitudinal end 2203 may be shaped to correspond with a shape of the overhanging protrusion (or longitudinally-directed-overhanging-protrusion) 2242 at the first longitudinal end 2202. According to various embodiments, each of the longitudinally-aligned-underside-socket 2244 and the longitudinally-aligned-upper-side-socket 2246 may be shaped to correspond exactly to that of the longitudinally-directed-overhanging-protrusion 2242 and the longitudinally-directed-foot-protrusion 2248. According to various embodiments, the plurality of connecting-floatation-units 2200 of the floating arrangement 2001 may be connected to form at least one row of connecting-floatation-units 2200. For example, the plurality of connecting-floatation-units 2200 may be connected or interlocked end-to-end (i.e. with a first longitudinal end 2202 of each connecting-floatation-unit 2200 coupled to a second longitudinal end 2203 of a neighboring or another/additional connecting-floatation-unit 2200) to form the at least one row of connecting-floatation-units 2200.

[000202] As shown, according to various embodiments, the floating arrangement 2001 may include two rows of connecting-floatation-units 2200 attached to two floatation assemblies 2000 respectively positioned between the two rows of connecting-floatation-units 2200.

[000203] FIG. 3A shows a perspective view of a floatation assembly 3000 with at least two support-floatation-units 3100, each support-floatation-unit 3100 including a connecting region 3144 of a respective first floatation segment 3110, 3510 and a respective second floatation segment 3130, 3530, according to various embodiments.

[000204] According to various embodiments, there may be provided the floatation assembly 3000.

[000205] According to various embodiments, the floatation assembly 3000 may contain any or all the features and/or limitations of the floatation assembly 1000 of FIG. 1A and FIG. 1B and/or the floatation assembly 2000 of FIG. 2A to FIG. 2H. In the following, the floatation assembly 3000 is described with like reference characters generally referring to the same or corresponding parts/features of the floatation assembly 1000 of FIG. 1A and FIG. 1B and/or the floatation assembly 2000 of FIG. 2A to FIG. 2H. The description of the parts/features made with respect to the floatation assembly 3000 may be applicable with respect to the floatation assembly 1000 and/or the floatation assembly 2000, and vice versa.

[000206] Accordingly, according to various embodiments, the floatation assembly 3000 may be configured to or may be suitable for supporting a unitary structure afloat a body of water (e.g. out at sea or dam or river or pond etc.). The unitary structure may include, but not limited to, a solar panel, solar power generation system, a solar power station etc., or any other structure or installation for any other suitable application, for example, wind turbine, aerator, pump or fish cage etc. Further, according to various embodiments, the unitary structure may be releasably attachable to the floatation assembly.

[000207] According to various embodiment, the floatation assembly 3000 may, similar to the floatation assembly 1000 of FIG. 1A and FIG. 1B and/or the floatation assembly 2000 of FIG. 2A to FIG. 2H, include at least two support-floatation-units 3100. As shown, each of the at least two support-floatation-units 3100 may include a symmetrical “T” shape.

[000208] According to various embodiment, each support-floatation-unit 3100 may, similar to the at least two support-floatation-units 1100 of the floatation assembly 1000 of FIG. 1A and FIG. 1B and/or the at least two support-floatation-units 2100 of the floatation assembly 2000 of FIG. 2A to FIG. 2H, include a corresponding primary connection portion

3150, 3550. As shown, according to various embodiments, the primary connection portion 3150, 3550 of each support-floatation-unit 3100 of the floatation assembly 3000 may include a primary through-hole 3366. The primary connection portions 3150, 3550 may be coupled together to form an overlapping rigid connection 3800 (see FIG. 3B) so as to be free of relative movement between the at least two support-floatation-units 3100. According to various embodiments, when the overlapping rigid connection 3800 is formed, the floatation assembly 3000 may have or form a "H" shape.

[000209] As an example (not shown), according to various other embodiments, at least two "V"-shaped support-floatation-units may be brought together to form an "X"-shaped floatation assembly, in contrast to the "H" shape.

[000210] With reference to FIG. 3A, each support-floatation-unit 3100 may respectively include the first floatation segment 3110, 3510 and the second floatation segment 3130, 3530. As shown, the first and the second floatation segments 3110, 3510, 3130, 3530, of each support-floatation-unit 3100, may be respectively adjoined to each other via a corresponding connecting region 3144 of the first and the second floatation segments 3110, 3510, 3130, 3530.

[000211] As shown, each corresponding connecting region 3144 of each support-floatation-unit 3100 may partially surround (e.g. adjoined) to a corresponding primary connection portion 3150, 3550 of the support-floatation-unit 3100. As shown, each connecting region 3144 may partially surround (e.g. in an uninterrupted manner) half of an entire or total perimeter (e.g. measured along a lateral plane) of the corresponding primary connection portion 3150, 3550. Accordingly, a pair of opposite edges 77 of each primary connection portion 3150, 3550 may be adjoined to (e.g. to a segment or portion of) the connecting region 3144 of a corresponding primary connection portion 3150, 3550 of a corresponding support-floatation-unit 3100.

[000212] According to various embodiments, with the pair of opposite edges 77 of each primary connection portion 3150, 3550 adjoined to the connecting region 3144 of the corresponding primary connection portion 3150, 3550 of the corresponding support-floatation-unit 3100, according to various embodiments, thus, when the primary connection portions 3150, 3550 of the at least two support-floatation-units 3100 are coupled together to form the overlapping rigid connection 3800, the connecting regions 3144 of the at least two support-floatation-units 3100 may come into contact or abutment or engagement with each other. Accordingly, the connecting regions 3144 of the at least two support-floatation-units

3100 (adjoined to respective opposite edges 77 of the primary connection portions 3150, 3550) may abut each other so as to prevent a rotational movement (e.g. along a horizontal plane or lateral plane of the floatation assembly 3000) of a first support-floatation-unit 3100a of the at least two support-floatation-units 3100 with respect to a second support-floatation-unit 3100a of the at least two support-floatation-units 3100.

[000213] According to various embodiments, each support-floatation-unit 3100 of the floatation assembly 3000 may, similar to the at least two support-floatation-units 1100 of the floatation assembly 1000 of FIG. 1A and FIG. 1B and/or the at least two support-floatation-units 2100 of the floatation assembly 2000 of FIG. 2A to FIG. 2H, include at least one securing element 3380 (e.g. a securing plate 3381 with a plurality of securing holes 3382). The at least one securing element 3380 may be configured to or may be capable of forming a releasable attachment with a unitary structure.

[000214] According to various embodiments, the at least two support-floatation-units 3100 may be coupled together in a manner so as to provide an arrangement of at least two securing elements 3380 evenly distributed around the overlapping rigid connection 3800 and equidistant from a center of the overlapping rigid connection 3800 configured to or for evenly supporting the unitary structure releasably attachable to the arrangement of at least two securing elements 3380.

[000215] As shown, each support-floatation-unit 3100 of the floatation assembly 3000 may include at least two securing elements 3380. Accordingly, as shown, according to various embodiments, the at least two support-floatation-units 3100 may be coupled together in a manner so as to provide an arrangement of at least four securing elements 3380 evenly distributed around the overlapping rigid connection 3800 and equidistant from a center of the overlapping rigid connection 3800 configured to or for evenly supporting the unitary structure releasably attachable to the arrangement of at least four securing elements 3380.

[000216] According to various embodiments, each support-floatation-unit 3100 may, similar to the at least two support-floatation-units 1100 of the floatation assembly 1000 of FIG. 1A and FIG. 1B and/or the at least two support-floatation-units 2100 of the floatation assembly 2000 of FIG. 2A to FIG. 2H, include at least one end-connection portion 3386. As shown, according to various embodiments, the at least one end-connection portion 3386 may include or may be a connection lug with an eyehole.

[000217] As shown, according to various embodiments, each end-connection portion 3386 (e.g. connection lug with eyehole) may be extending from or may form an extension of a corresponding securing element 3380 (e.g. a corresponding securing plate 3381). Accordingly, according to various embodiments, each end-connection portion 3386 may be parallel with a corresponding securing element 3380 from which the end-connection portion 3386 extends. According to various embodiments, each end-connection portion 3386 may have an equal (e.g. substantially equal) thickness as a corresponding securing element 3380 (e.g. from which the end-connection portion 3386 extends).

[000218] FIG. 3B shows a top view of a floating arrangement 3001 which includes the floatation assembly 3000 of FIG. 3A and at least one connecting-floatation-unit 3200, according to various embodiments; and FIG. 3C shows a perspective view of the connecting-floatation-unit 3200 of the floating arrangement 3001 of FIG. 3B, according to various embodiments.

[000219] According to various embodiments, there may be provided the floating arrangement 3001.

[000220] According to various embodiments, the floating arrangement 3001 may contain any or all the features and/or limitations of the floating arrangement 1001 of FIG. 1E and FIG. 1F and/or the floating arrangement 2001 of FIG. 2T. In the following, the floating arrangement 3001 is described with like reference characters generally referring to the same or corresponding parts/features of the floating arrangement 1001 of FIG. 1E and FIG. 1F and/or the floating arrangement 2001 of FIG. 2T. The description of the parts/features made with respect to the floating arrangement 3001 may be applicable with respect to the floating arrangement 1001 of FIG. 1E and FIG. 1F and/or the floating arrangement 2001 of FIG. 2T, and vice versa.

[000221] According to various embodiments, the floating arrangement 3001 may include at least one floatation assembly 3000 and/or at least one floatation assembly 2000 and/or at least one floatation assembly 3000 as described herein.

[000222] According to various embodiments, the floating arrangement 3001 may, similar to the floating arrangement 1001 of FIG. 1E and FIG. 1F and/or the floating arrangement 2001 of FIG. 2T, include at least one connecting-floatation-unit 3200.

[000223] As shown in FIG. 3C, the body (e.g. elongate body) 3201 of the at least one connecting-floatation-unit 3200 may include a first longitudinal end or end region 3202 and a second longitudinal end or end region 3203.

[000224] According to various embodiments, end portions (e.g. respective longitudinal end regions) of the at least two support-floatation-units 3100 may be respectively coupled to the body (e.g. elongate body) 3201 of (each of) the at least one connecting-floatation-unit 3200. For example, according to various embodiments, the end portions of the at least two support-floatation-units 3100 of the floatation assembly 3000 may be respectively coupled to the first longitudinal end or end region 3202 and the second longitudinal end or end region 3203 of the body 3201 of the at least one connecting-floatation-unit 3200 such that the body 3201 of the at least one connecting-floatation-unit 3200 may be connected across the end portions of the at least two support-floatation-units 3100 of the floatation assembly 3000.

[000225] As another example, according to various other embodiments, one end portion of one support-floatation-unit 3100 (of the at least two support-floatation-units 3100) of the floatation assembly 3000 may be coupled to a segment (e.g. first longitudinal end 3202, second longitudinal end 3203, or a middle region between the first longitudinal end 3202 and the second longitudinal end 3203) along a first body 1101, 2201, 3201 of a first connecting-floatation-unit 1200, 2200, 3200. Further, according to various other embodiments, another end portion of another support-floatation-unit 3100 (of the at least two support-floatation-units 3100) of the floatation assembly 3000 may be coupled to a segment along a second body 1101, 2201, 3201 of a second connecting-floatation-unit 1200, 2200, 3200. Further, according to various other embodiments, the first and the second connecting-floatation-units 1200, 2200, 3200 (i.e. which are connected to the floatation assembly 3000) may be connected to each other so as to be in engagement / abutment with each other or may be spaced apart from each other.

[000226] With reference to FIG. 3C, the at least one connecting-floatation-unit 3200 of the floating arrangement 3001 may include at least one end-connection portion 3206. As shown, according to various embodiments, the at least one end-connection portion 3206 may include or may be a connection lug with an eyehole. As shown, according to various embodiments, each connecting-floatation-unit 3200 may include a pair of adjacent and/or adjoined end-connection portions 3206 at each corner (e.g. each of four corners) of the connecting-floatation-unit 3200. For example, as shown, according to various embodiments, each connecting-floatation-unit 3200 may include four pairs of adjacent and/or adjoined end-connection portions 3206, or may include eight end-connection portions 3206.

[000227] Accordingly, according to various embodiments, the at least one end-connection portion 3386 (e.g. connection lug) of each of the at least two support-floatation-units 3100

may be placed together with the at least one end-connection portion 3206 (e.g. connection lug) of the at least one connecting-floatation-unit 3200, so as to connect or couple the at least two support-floatation-units 3100 and the at least one connecting-floatation-unit 3200 together.

[000228] With reference to FIG. 3B, the floating arrangement 3001 may include a plurality of floatation assemblies 3000 and a plurality of connecting-floatation-units 3200.

[000229] With reference to FIG. 3C, the main body (or elongate main body) 3201 of each connecting-floatation-unit 3200 may include an overhanging protrusion (or longitudinally-directed-overhanging-protrusion) 3342 extending longitudinally outwards or directed away from an upper half of the first longitudinal end 3202 of the main body (or elongate main body) 3201 of the connecting-floatation-unit 3200 and an underside socket (or longitudinally-aligned-underside-socket) 3244 extending inwards at a lower half of the first longitudinal end 3202 of the main body (or elongate main body) 3201 of the connecting-floatation-unit 3200. Further, the main body (or elongate main body) 3201 of each connecting-floatation-unit 3200 may include an upper-side socket (or longitudinally-aligned-upper-side-socket) 3246 extending inwards at an upper half of the second longitudinal end 3203 of the main body (or elongate main body) 3201 of the connecting-floatation-unit 3200 and a foot protrusion (or longitudinally-directed-foot-protrusion) 3248 extending longitudinally from a lower half of the second longitudinal end 3203 of the main body (or elongate main body) 3201 of the connecting-floatation-unit 3200. The underside socket (or longitudinally-aligned-underside-socket) 3244 at the first longitudinal end 3202 may be shaped to correspond with a shape of the foot protrusion (or longitudinally-directed-foot-protrusion) 3248 at the second longitudinal end 3203, and the upper-side socket (or longitudinally-aligned-upper-side-socket) 3246 at the second longitudinal end 3203 may be shaped to correspond with a shape of the overhanging protrusion (or longitudinally-directed-overhanging-protrusion) 3342 at the first longitudinal end 3202. According to various embodiments, each of the longitudinally-aligned-underside-socket 3244 and the longitudinally-aligned-upper-side-socket 3246 may be shaped to correspond exactly to that of the longitudinally-directed-overhanging-protrusion 3342 and the longitudinally-directed-foot-protrusion 3248. According to various embodiments, the plurality of connecting-floatation-units 3200 of the floating arrangement 3001 may be connected to form at least one row of connecting-floatation-units 3200. For example, the plurality of connecting-floatation-units 3200 may be connected or interlocked end-to-end (i.e. with the first

longitudinal end 3202 of each connecting-floatation-unit 3200 coupled to a second longitudinal end 3203 of a neighboring or another/additional connecting-floatation-unit 3200) to form the at least one row of connecting-floatation-units 3200.

[000230] As shown in FIG. 3B, according to various embodiments, the connecting-floatation-unit 2200 may be connected or interlocked with the connecting-floatation-unit 3200.

[000231] According to various embodiments, a plurality of floatation assemblies 3000 may be connected to form at least one row of floatation assemblies 3000. As shown, a plurality of floatation assemblies 3000 may be connected to form two rows of floatation assemblies 3000, each row including at least two floatation assemblies 3000.

[000232] As shown, according to various embodiments, the floating arrangement 3001 may include two rows of connecting-floatation-units 3200 attached to two rows of floatation assemblies 3000 respectively positioned between the two rows of connecting-floatation-units 3200, thereby forming a border demarcated by the two rows of connecting-floatation-units 3200 and the two rows of floatation assemblies 3000.

[000233] According to various embodiments, the floating arrangement 3001 may include any number of row(s) of connecting-floatation-units 1200, 2200, 3200 attached to any number of row(s) of floatation assemblies 1000, 2000, 3000

[000234] FIG. 4A shows a perspective view of a connecting-floatation-unit 4200 including at least one laterally-directed-connection-portion 4207, according to various embodiments.

[000235] As shown, a body (e.g. elongate body) 4201 of the connecting-floatation-unit 4200 may include a first longitudinal end or end region 4202 and a second longitudinal end or end region 4203.

[000236] According to various embodiments, the connecting-floatation-unit 4200 may, similar to the connecting-floatation-unit 1200 of FIG. 1E and FIG. 1F and/or the connecting-floatation-unit 2200 of FIG. 2U and/or the connecting-floatation-unit 3200 of FIG. 3C, include at least one end-connection portion 4206. As shown, according to various embodiments, the at least one end-connection portion 4206 may include or may be a connection lug with an eyehole.

[000237] According to various embodiments, the connecting-floatation-unit 4200 may, similar to the connecting-floatation-unit 1200 of FIG. 1E and FIG. 1F and/or the connecting-floatation-unit 2200 of FIG. 2U and/or the connecting-floatation-unit 3200 of FIG. 3C,

include one or more of an overhanging protrusion (or longitudinally-directed-overhanging-protrusion) 4242, an underside socket (or longitudinally-aligned-underside-socket) 4244, an upper-side socket (or longitudinally-aligned-upper-side-socket) 4246, and/or a foot protrusion (or longitudinally-directed-foot-protrusion) 4248.

[000238] As shown in FIG. 4A, according to various embodiments, the connecting-floatation-unit 4200 may include at least one laterally-directed-connection-portion 4207, between the first and the second longitudinal ends or end regions 4202, 4203 of the connecting-floatation-unit 4200 (or between a pair of at least one end-connection portions 4206 respectively positioned at the first and the second longitudinal ends 4202, 4203). As shown, according to various embodiments, the at least one laterally-directed-connection-portion 4207 may, similar or identical to the at least one end-connection portion 4206, include or may be a connection lug with an eyehole. As shown, according to various embodiments, the connecting-floatation-unit 4200 may include four laterally-directed-connection-portions 4207. Accordingly, according to various embodiments, respective laterally-directed-connection-portion 4207 of respective connecting-floatation-units 4200 of a plurality of connecting-floatation-units 4200 may be coupled to each other (e.g. via a nut and bolt assembly) in a side-by-side manner.

[000239] FIG. 4B shows a perspective view of a first variant connecting-floatation-unit 4200a of the connecting-floatation-unit 4200 of FIG. 4A, according to various embodiments.

[000240] As shown in FIG. 4B, the first variant connecting-floatation-unit 4200a may further include a laterally-directed-overhanging-protrusion 4282 extending laterally outwards from an upper half of a first lateral side wall 140a (e.g. one of the two opposite lateral side walls 140a) of the main body (or elongate main body) 4201, and a laterally-aligned-underside-socket 4284 extending inwards at a lower half of the first lateral side wall 140a of the main body (or elongate main body) 4201. According to various embodiments, the laterally-aligned-underside-socket 4284 may be shaped to correspond exactly to that of the laterally-directed-overhanging-protrusion 4282.

[000241] FIG. 4C shows a perspective view of a second variant connecting-floatation-unit 4200b of the connecting-floatation-unit 4200 of FIG. 4A, according to various embodiments.

[000242] As shown, according to various embodiments, the second variant connecting-floatation-unit 4200b may include the laterally-directed-overhanging-protrusion 4282 and the laterally-aligned-underside-socket 4284.

[000243] Further, as shown, according to various embodiments, the second the second variant connecting-floatation-unit 4200b may include a laterally-aligned-upper-side-socket 4286 extending inwards at an upper half of a second lateral side wall 140a (e.g. another side wall opposite the first lateral side wall) of the main body (or elongate main body) 4201, and a laterally-directed-foot-protrusion 4288 extending laterally from a lower half of the second lateral side wall 140a of the main body (or elongate main body) 4201. According to various embodiments, the laterally-aligned-upper-side-socket 4286 may be shaped to correspond exactly to that of the laterally-directed-foot-protrusion 4288.

[000244] Accordingly, according to various embodiments, one or more first variant connecting-floatation-units 4200a and/or one or more second variant connecting-floatation-units 4200b may be connected or interlocked side-by-side (i.e. with a first lateral side wall 140a of one or more first variant connecting-floatation-units 4200a and/or one or more second variant connecting-floatation-units 4200b directed to a second lateral side wall 140a of a neighboring or another one or more first variant connecting-floatation-units 4200a and/or one or more second variant connecting-floatation-units 4200b).

[000245] According to various embodiments, the floating arrangement 1001, 2001 and/or 3001 may, alternatively or additionally, include any one or more of the connecting-floatation-unit 4200 and/or the first variant connecting-floatation-unit 4200a and/or the second variant connecting-floatation-unit 4200b. For example, the floating arrangement 1001, 2001 or 3001 may include any one or more of the connecting-floatation-unit 4200 and/or the first variant connecting-floatation-unit 4200a and/or the second variant connecting-floatation-unit 4200b, in replacement of or in addition to the connecting-floatation-unit 1200, 2200 and/or 3200.

[000246] Various embodiments thus provide a floatation assembly which may be manufactured efficiently and at low-cost.

[000247] Various embodiments may also provide a floatation assembly which may be disassembled (or taken apart) in order to facilitate transport of the floatation assembly (e.g. from factory or manufacturing plate to open waters such as a sea or ocean or dam or river or pond).

[000248] Various embodiments may also provide a floatation assembly which may be assembled in a simple manner to form a rigid and study assembled floatation assembly capable of supporting a weighted structure (e.g. a unitary solar panel) afloat.

[000249] Various embodiment also provides a floating arrangement, which includes the floatation assembly for supporting a unitary structure and at least one connecting-floatation-unit (e.g. which may serve as a pathway).

[000250] While the invention has been particularly shown and described with reference to specific embodiments, it should be understood by those skilled in the art that various changes, modification, variation in form and detail may be made therein without departing from the scope of the invention as defined by the appended claims. The scope of the invention is thus indicated by the appended claims and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced.

CLAIMS

1. A floatation assembly for supporting a unitary structure afloat, the unitary structure being releasably attachable to the floatation assembly, the floatation assembly comprising:

at least two support-floatation-units, each support-floatation-unit comprising a primary connection portion, the primary connection portions of the at least two support-floatation-units being coupled together to form an overlapping rigid connection so as to be free of relative movement between the at least two support-floatation-units.

2. The floatation assembly of claim 1,

wherein each support-floatation-unit comprises at least one securing element, the at least one securing element being capable of forming a releasable attachment with the unitary structure,

wherein the at least two support-floatation-units are coupled together in a manner so as to provide an arrangement of at least two securing elements distributed around the overlapping rigid connection and equidistant from a center of the overlapping rigid connection for supporting the unitary structure releasably attachable to the arrangement of at least two securing elements.

3. The floatation assembly of claim 1 or claim 2,

wherein the at least two support-floatation-units are coupled together in a manner so as to cross over each other about the overlapping rigid connection.

4. The floatation assembly of any one of claims 1 to 3,

wherein the primary connection portion of each support-floatation-unit comprises a connection plate comprising

an abutment surface,

an outward facing surface opposite the abutment surface, and

a primary through-hole extending between the abutment surface and the outward facing surface,

wherein the primary connection portions of the at least two support-floatation-units are coupled together to form the overlapping rigid connection in a manner so as to overlap the connection plates of the primary connection portions of the at least two support-floatation-units with the abutment surfaces thereof respectively directed towards each other, and the primary through-holes thereof respectively aligned to each other.

5. The floatation assembly of claim 4, further comprising

a bolt inserted through the primary through-holes of the connection plates of the primary connection portions of the at least two support-floatation-units that are aligned to each other, and

a nut in engagement with the bolt to lock the connection plates of the primary connection portions of the at least two support-floatation-units together,

wherein a head of the bolt and the nut are respectively bearing against the outward facing surfaces of the connection plates of the primary connection portions of the at least two support-floatation-units.

6. The floatation assembly of claim 4 or claim 5,

wherein the primary connection portion of each support-floatation-unit comprises a pair of parallel opposing reinforcing walls extending away from the outward facing surface of the connection plate thereof,

wherein the pair of parallel opposing reinforcing walls being respectively on two opposite sides of the primary through-hole of the connection plate, each of the pair of parallel opposing reinforcing walls respectively running along an entire extend across a corresponding region of the connection plate.

7. The floatation assembly of claim 6,

wherein each of the pair of parallel opposing reinforcing walls is a single layer wall or a double layer wall.

8. The floatation assembly of claim 7,

wherein, when each of the pair of parallel opposing reinforcing walls is the double layer wall, the double layer wall comprises

a pair of spaced apart parallel first and second wall layers,

a roof layer suspended across the pair of spaced apart parallel first and second wall layers, and

a plurality of strengthening structures distributed along the double layer wall lengthwise, each strengthening structure extending between the pair of spaced apart parallel first and second wall layers and across the roof layer.

9. The floatation assembly of any one of claims 1 to 8,

wherein the primary connection portion of each support-floatation-unit further comprises at least one reinforcing ridge.

10. The floatation assembly of claim 9,

wherein the primary connection portion of each support-floatation-unit further comprises two reinforcing ridges extending from the outward facing surface of the connection plate thereof, the two reinforcing ridges being respectively aligned to two opposite radial directions extending from a center of the primary through-hole of the connection plate along the outward facing surface, the two opposite radial directions being parallel to the pair of parallel opposing reinforcing walls.

11. The floatation assembly of any one of claims 1 to 10,

wherein the primary connection portion of each support-floatation-unit comprises

at least one pin structure, and

at least one pin-receiving through-hole.

12. The floatation assembly of claim 11, wherein

the at least one pin structure extends perpendicularly away from the abutment surface of the connection plate thereof, and

the at least one pin-receiving through-hole extends through the connection plate thereof,

wherein the primary connection portions of the at least two support-floatation-units are coupled together to form the overlapping rigid connection with the at least one pin structure of the connection plate of the primary connection portion of a first of the at least two support-floatation-units inserted through the at least one pin-receiving through-hole of the connection plate of the primary connection portion of a second of the at least two support-floatation-units and the at least one pin structure of the connection plate of the primary connection portion of the second of the at least two support-floatation-units inserted through the at least one pin-receiving through-hole of the connection plate of the primary connection portion of the first of the at least two support-floatation-units.

13. The floatation assembly of claim 11 or claim 12,

wherein each pin structure of the primary connection portion of each support-floatation-unit comprises a split end portion that forms at least two cantilever members extending from the abutment surface of the connection plate thereof;

wherein each cantilever member comprises an overhang element protruding sideways from a tip of each cantilever member,

wherein the overhang elements of the at least two cantilever members are directed away from each other for hooking a corresponding pin-receiving through-hole when inserted therein.

14. The floatation assembly of any one of claims 1 to 13,

wherein each support-floatation-unit comprises a first floatation segment and a second floatation segment respectively adjoined to opposite edges of the primary connecting portion in a manner such that the primary connecting portion interconnects the first floatation segment and the second floatation segment.

15. The floatation assembly of claim 14,

wherein each of the first floatation segment and the second floatation segment of each support-floatation-unit comprises a channel formation extending along a roof surface thereof with a channel opening at an end of the channel formation opening at an edge of the roof surface for directing a liquid to flow along the channel formation and out of the roof surface.

16. The floatation assembly of claim 14 or claim 15,

wherein each of the first floatation segment and the second floatation segment of each support-floatation-unit further comprises at least one end-connection portion,

wherein the at least one end-connection portion protrudes sideways from a side wall of each of the first floatation segment and the second floatation segment of each support-floatation-unit.

17. The floatation assembly of claim 16,

wherein the side wall is reinforced with at least one reinforcing border in a form of a border wall thicker than other walls of each support-floatation-unit.

18. A floating arrangement for supporting a unitary structure, the floating arrangement comprising:

the floatation assembly of any one of claims 1 to 17; and

at least one connecting-floatation-unit comprising an elongate body,

wherein an end portion of one of the at least two support-floatation-units of the floatation assembly is coupled to the elongate body of the at least one connecting-floatation-unit.

19. The floating arrangement of claim 18,

wherein the elongate body of the at least one connecting-floatation-unit comprises a first longitudinal end and a second longitudinal end,

wherein the end portion of the one of the at least two support-floatation-units of the floatation assembly is coupled to the first longitudinal end of the elongate body and an end portion of another one of the at least two support-floatation-units of the floatation assembly is coupled to the second longitudinal end of the elongate body such that the elongate body of the at least one connecting-floatation-unit is connected across the end portions of the at least two support-floatation-units of the floatation assembly.

20. The floating arrangement of claim 18, comprising

two floatation assemblies,

wherein the elongate body of the at least one connecting-floatation-unit comprises a first portion and a second portion,

wherein the end portion of the one of the at least two support-floatation-units of a first of the two floatation assemblies is coupled to the first portion of the elongate body and the end portion of the at least two support-floatation-units of a second of the two floatation assemblies is coupled to the second portion of the elongate body such that the elongate body of the at least one connecting-floatation-unit interconnects the two floatation assemblies.

21. The floating arrangement of claim 20,

wherein the first portion of the elongate body of the at least one connecting-floatation-unit is a first longitudinal end of the elongate body and the second portion of the elongate body of the at least one connecting-floatation-unit is a second longitudinal end of the elongate body.