



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
24.05.2023 Bulletin 2023/21

(51) International Patent Classification (IPC):
B65D 21/08 (2006.01) **B65D 88/02** (2006.01)
B65D 88/76 (2006.01) **B65D 21/02** (2006.01)

(21) Application number: **22208098.8**

(52) Cooperative Patent Classification (CPC):
B65D 88/022; B65D 21/0201; B65D 21/083;
B65D 88/76; E03B 3/03; E03B 11/02; E03B 11/04

(22) Date of filing: **17.11.2022**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(72) Inventors:
• **KUMAR, Vigneshwar**
560100 Bangalore (IN)
• **PANKAJ, Shireesh**
560100 Bangalore (IN)
• **PANCHOLI, Lokesh**
560100 Bangalore (IN)

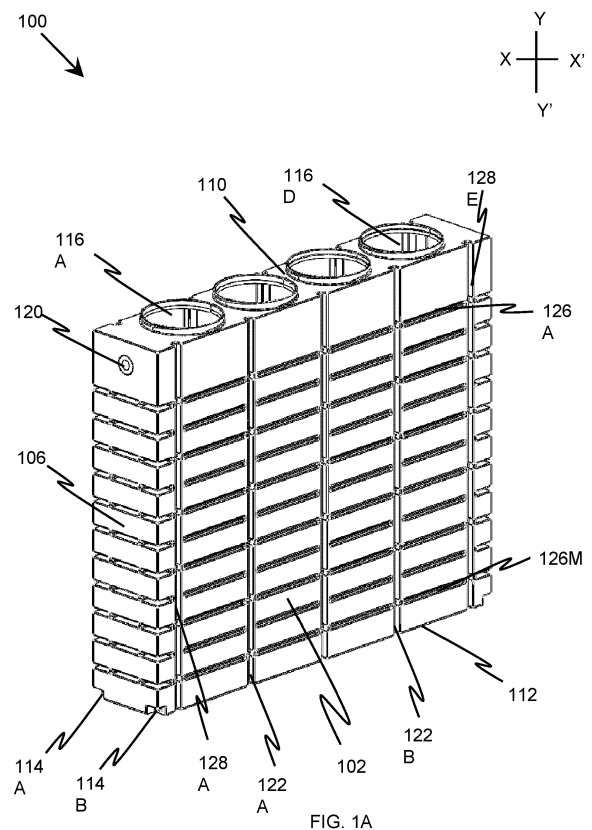
(30) Priority: **18.11.2021 IN 202141053083**

(74) Representative: **Sach, Greg Robert**
C/o KA Filing (EU) Limited
Siedlungsstr. 4a
85253 Erdweg (DE)

(71) Applicant: **Ashirvad Pipes Pvt. Ltd**
Karnataka, Bangalore 562107 (IN)

(54) **MODULAR STORAGE UNIT FOR MODULAR CONSTRUCTION**

(57) Disclosed is a modular storage unit (100, 200) that includes first and second panels (202, 204) disposed substantially parallel to each other; third and fourth panels (106, 108) disposed substantially parallel to each other and substantially orthogonal to the first and second panels (202, 204); a cavity (212) defined between the first panel (102, 202), the second panel (104, 204), the third panel (106) and the fourth panel (108); a plurality of through holes (114). The first and second through holes (114A, 114B) of the plurality of through holes (114) are disposed on the third panel (106) and third and fourth through holes (114C, 114D) of the plurality of through holes (114) are disposed on the fourth panel (108).



Description

TECHNICAL FIELD

[0001] The present disclosure relates generally to storage tanks and/or silos. More particularly, the present disclosure relates to a modular storage unit for a modular construction.

BACKGROUND

[0002] Efforts have been made in past to create water collection systems that provide storage containment in association with habitable dwellings. Mostly, such efforts have taken the form of either tanks having walls that forms a part of an upright foundation, or underground storage tanks that are wholly separated from a foundation of a habitable structure.

[0003] Traditionally, the storage structures are made up of concrete and cemented materials that adds on a lot of weight to the structure. This increases difficulty in carrying the walls of the storage structures from one place to another and causing difficulty in deploying the walls at a construction site. Construction of a storage structure by conventional walls require lot of different materials, painting, and time. Furthermore, there is a huge requirement of bricks, concrete blocks, precast concrete and masonry labour for constructing the storage structure. The storage structure made up of conventional cemented walls is a fixed structure and shape of the storage structure therefore cannot be changed. In order to minimise the efforts, walls made up of plastic and wood are used for constructing storage structures. Since, wood and plastic cannot add sufficient strength to the structure, therefore limiting the usage of wooden and plastic walls. Furthermore, walls of the conventional storage structures are not capable of withstanding high winds when the storage structures are used for elevated applications. Therefore, high winds and drag forces lead the structures to fall/damage easily.

[0004] Walls of the conventional storage structures gets bulged when the storage structure holds full-capacity of water. Therefore, walls of the conventional storage structures need repair or maintenance which is a time-consuming activity and thereby interrupting the water supply from the storage structures. Moreover, the walls of the conventional storage structures are rigid and therefore shape and size of the conventional storage structures cannot be changed or modified as per the requirements.

[0005] Therefore, there exists a need for an efficient storage structure that is capable of solving aforementioned problems.

SUMMARY

[0006] In an aspect of the present disclosure, a modular storage unit is disclosed. The modular storage unit includes first and second panels disposed substantially

parallel to each other; third and fourth panels disposed substantially parallel to each other and substantially orthogonal to the first and second panels; a cavity defined between the first through fourth panels; a plurality of through holes. The first and second through holes of the plurality of through holes are disposed on the third panel and third and fourth through holes of the plurality of through holes are disposed on the fourth panel.

[0007] In some embodiments, the modular storage unit further includes first and second pair of clamp slots disposed on the first and second panels, respectively, to clamp the modular storage unit to a surface.

[0008] In some embodiments, the cavity is a single continuous cavity.

[0009] In some embodiments, the cavity is a continuous spiral cavity.

[0010] In some embodiments, when the cavity is the continuous spiral cavity, the first and second panels includes first and second pair of cut outs, respectively, such that the first and second pair of cut outs form a plurality of conical frustum shaped webs between the first and second panels.

[0011] In some embodiments, the modular storage unit further includes fifth and sixth panels disposed substantially parallel to each other and orthogonal to the first and second panels and the third and fourth panels.

[0012] In some embodiments, the modular storage unit further includes one or more openings that are disposed on the fifth panel and (ii) one or more lids adapted to conceal the one or more openings.

[0013] In some embodiments, the modular storage unit further includes one or more overflow holes that are disposed on one of, the third panel and the fourth panel.

[0014] In some embodiments, the plurality of through holes are adapted to (i) drain fluid from the modular storage unit and (ii) couple an adjacent modular storage unit that is substantially similar to the modular storage unit, to the modular storage unit.

[0015] In another aspect of the present disclosure, a modular construction is disclosed. The modular construction includes a plurality of modular storage units coupled to each other, wherein each modular storage unit of the plurality of modular storage units includes first and second panels disposed substantially parallel to each other; third and fourth panels disposed substantially parallel to each other and substantially orthogonal to the first and second panels; a cavity defined between the first through fourth panels; a plurality of through holes. The first and second through holes of the plurality of through holes are disposed on the third panel and third and fourth through holes of the plurality of through holes are disposed on the fourth panel. The plurality of through holes are adapted to couple adjacent modular storage units of the plurality of modular storage units.

[0016] In some embodiments, the modular construction further comprising one or more connectors adapted to be inserted in at least one of the plurality of through holes to couple adjacent modular storage units of the

plurality of modular storage units.

[0017] In some embodiments, each modular storage unit of the plurality of modular storage units further comprising first and second pair of clamp slots disposed on the first and second panels, respectively, to clamp the modular construction to a surface.

[0018] In some embodiments, to clamp the modular construction to the surface, each clamp slot of the first and second pair of clamp slots is adapted to receive a clamp such that the clamp holds each modular storage unit of the plurality of modular storage units by the surface.

[0019] In some embodiments, when the cavity is the continuous spiral cavity, the first and second panels comprises first and second pair of cut outs, respectively, such that the first and second pair of cut outs form a plurality of conical frustum shaped web between the first and second panels.

[0020] In some embodiments, each modular storage unit of the plurality of modular storage units further comprising fifth and sixth panels disposed substantially parallel to each other and orthogonal to the first and second panels and the third and fourth panels.

[0021] In some embodiments, each modular storage unit of the plurality of modular storage units further comprising (i) one or more openings that are disposed on the fifth panel and (ii) one or more lids adapted to conceal the one or more openings.

[0022] In some embodiments, each modular storage unit of the plurality of modular storage units further comprising one or more overflow holes disposed on one of, the third panel and the fourth panel.

[0023] In some embodiments, the plurality of through holes of each modular storage unit of the plurality of modular storage units are further adapted to drain fluid.

BRIEF DESCRIPTION OF DRAWINGS

[0024] The above and still further features and advantages of embodiments of the present disclosure becomes apparent upon consideration of the following detailed description of embodiments thereof, especially when taken in conjunction with the accompanying drawings, and wherein:

FIG. 1A and FIG. 1B illustrate a perspective view of a modular storage unit, in accordance with an embodiment herein;

FIG. 1C illustrates a top view of the modular storage unit of FIG. 1A and FIG. 1B, in accordance with an embodiment herein;

FIG. 2A and FIG. 2B illustrate a perspective view of a modular storage unit, in accordance with an embodiment herein;

FIG. 2C illustrates a top view of the modular storage

unit of FIG. 2A and FIG. 2B, in accordance with an embodiment herein;

FIG. 3 illustrates a perspective view of a modular construction, in accordance with an embodiment herein; and

FIG. 4A-4G illustrate different configurations of the modular construction of FIG. 3, in accordance with an embodiment herein. To facilitate understanding, like reference numerals have been used, where possible, to designate like elements common to the figures.

DETAILED DESCRIPTION

[0025] Various embodiments of the present disclosure provide a modular storage unit for a modular construction. The following description provides specific details of certain embodiments of the disclosure illustrated in the drawings to provide a thorough understanding of those embodiments. It should be recognized, however, that the present disclosure can be reflected in additional embodiments and the disclosure may be practiced without some of the details in the following description.

[0026] The various embodiments including the example embodiments are now described in detail with reference to the accompanying drawings, in which the various embodiments of the disclosure are shown. The disclosure may, however, be embodied in different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure is thorough and complete, and fully conveys the scope of the disclosure to those skilled in the art. In the drawings, the sizes of components may be exaggerated for clarity.

[0027] It is understood that when an element or layer is referred to as being "on," "connected to," or "coupled to" another element or layer, it can be directly on, connected to, or coupled to the other element or layer or intervening elements or layers that may be present. As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items.

[0028] The subject matter of example embodiments, as disclosed herein, is described with specificity to meet statutory requirements. However, the description itself is not intended to limit the scope of this disclosure. Rather, the inventor/inventors have contemplated that the claimed subject matter might also be embodied in other ways, to include different features or combinations of features similar to the ones described in this document, in conjunction with other technologies. Generally, the various embodiments including the example embodiments relate to a modular storage unit for a modular construction.

[0029] As mentioned, there remains a need for efficient storage systems with a flexible configuration and the embodiment herein provides a modular storage unit for a

modular construction that can exhibit different shapes and store various types of fluids.

[0030] The term "spiral" as used herein the context of the cavity of the present disclosure refers to the shape of the path of the cavity (within the modular storage unit) that is formed by virtue of presence of the cut-outs in the first and second panels of the modular storage unit.

[0031] FIG. 1A and FIG. 1B illustrate a perspective view of a modular storage unit 100, in accordance with an embodiment herein. The modular storage unit 100 may be used to store and/or hold various kinds of fluids (for sake of brevity, herein referred to as "fluid"). The modular storage unit 100 may further be used to harvest rainwater. By virtue of light weight, the modular storage unit 100 may be easily deployed at a construction site.

[0032] The modular storage unit 100 may include a first panel 102, a second panel 104, a third panel 106, a fourth panel 108, a fifth panel 110, and a sixth panel 112. The modular storage unit 100 may further include a longitudinal axis Y-Y' and a lateral axis X-X' as shown in direction index in FIG. 1A and FIG. 1B.

[0033] The first and second panels 102 and 104 may be disposed substantially parallel to each other. Specifically, the first and second panels 102 and 104 may extend along the longitudinal axis Y-Y' and the lateral axis X-X' of the modular storage unit 100.

[0034] The third and fourth panels 106 and 108 may be disposed substantially parallel to each other and substantially orthogonal to the first and second panels 102 and 104. The third and fourth panels 106 and 108 may extend along the longitudinal axis Y-Y' and the lateral axis X-X' of the modular storage unit 100.

[0035] The fifth and sixth panels 110 and 112 may be disposed substantially parallel to each other and orthogonal to the first and second panels 102 and 104 and third and fourth panels 106 and 108. The fifth panel 110 may be disposed at an upper side of the first and second panels 102 and 104. The fifth panel 110 may extend along the longitudinal axis Y-Y' and the lateral axis X-X' of the modular storage unit 100. The sixth panel 112 may be disposed at a lower side of the first and second panels 102 and 104 of the modular storage unit 100. In some embodiments, the first through sixth panels 102-112 may have shape such as, but not limited to, a square, a rectangle, and the like. Embodiments of the present disclosure are intended to include and/or otherwise cover any type of the shape for the first through sixth panels 102-112, without deviating from the scope of the present disclosure.

[0036] In some embodiments, a distance between the third and fourth panels 106, 108 along the lateral axis X-X' of the modular storage unit 100 *i.e.*, a length of the fifth panel 110 along the lateral axis X-X' of the modular storage unit 100 may lie in a range between 2000 millimeters (mm) and 2500 millimeters. Preferably, the distance between the third and fourth panels 106, 108 may be 2400 mm.

[0037] In some embodiments, distance between the

fifth and sixth panels 110, 112 along the longitudinal axis Y-Y' of the modular storage unit 100 *i.e.*, a length of the third and fourth panels may lie in a range between 1500 mm and 2000 mm. Preferably, the distance between the fifth and sixth panels 110, 112 may be 1980 mm.

[0038] In some embodiments, a distance between the first and second panels 102 and 104 *i.e.*, a width of the modular storage unit 100 may lie in a range between 450 mm and 500 mm. Preferably, the distance between the first and second panels 102 and 104 may be 465 mm.

[0039] In some embodiments, the first through sixth panels 102-112 of the modular storage unit 100 may be made up of a material such as, but not limited to, polyethylene, olefin, acrylonitrile butadiene styrene (ABS), polyamides, thermo-plastics, and the like. Embodiments of the present disclosure are intended to include and/or otherwise cover any type of the material for the modular storage unit 100 that is light in weight and can provide better heat and noise insulation, without deviating from the scope of the present disclosure.

[0040] In some embodiments, the modular storage unit 100 may be manufactured by a roto-moulding process. The roto-moulding process may provide requisite strength to the material of the modular storage unit 100. The roto-moulding process may allow the modular storage unit 100 to exhibit a single-body structure. Further, the roto-moulding process may ensure a uniform thickness of the modular storage unit 100. During fabrication of the modular storage unit 100 by roto-moulding process, a number of moulding pins may be used, which may improve the strength of the modular storage unit 100 against bulging or bulge loading.

[0041] In some embodiments, the modular storage unit 100 may be adapted to form a part of one of a building, a construction premises, and the like.

[0042] In some embodiments, the modular storage unit 100 may be used in one of solar heater plants, sewage treatment plants, other water purification systems, and the like.

[0043] In some embodiments, the modular storage unit 100 may include curved corners that may increase a wind resistance when the modular storage unit 100 is deployed in areas having windy environment.

[0044] In some embodiments, the modular storage unit 100 may exhibit a single-body/uniform-body structure. The modular storage unit 100 may therefore be fabricated as a single piece.

[0045] In some embodiments, the first through sixth panels 102-112 may be manufactured as discrete elements that may be assembled on site to form the modular storage unit 100. To assemble the modular storage unit 100, the first through sixth panels 102-112 may be coupled to each other to form the structure of the modular storage unit 100. The first through sixth panels 102-112 may be removably coupled to each other that allows the modular storage unit 100 to be disassembled at the time of transportation of the modular storage unit 100 to a construction site.

[0046] In some embodiments, the modular storage unit 100 may be light in weight. The modular storage unit 100 may be portable that facilitates easy transportation of the modular storage unit 100. In some embodiments, the modular storage unit 100 may be pre-moulded and pre-coloured. In some embodiments, the modular storage unit 100 may require less space than the conventional storage units, while the modular storage unit 100 is being deployed at the site.

[0047] The modular storage unit 100 may further include a plurality of through holes 114 of which first through fourth through holes 114A-114D are shown. The first and second through holes 114A and 114B of the first through fourth through holes 114A-114D may be disposed on the third panel 106. The third and fourth through holes 114C and 114D of the first through fourth through holes 114A-114D may be disposed on the fourth panel 108. The first through fourth through holes 114A-114D may be adapted to drain fluid from the modular storage unit 100. The first through fourth through holes 114A-114D may further be adapted to couple an adjacent modular storage unit that is substantially similar to the modular storage unit 100, to the modular storage unit 100.

[0048] The modular storage unit 100 may further include one or more overflow holes 120 that are disposed on either the third panel 106 or the fourth panel 108, or both. The one or more overflow holes 120 may be adapted to facilitate overflow of the fluid when the modular storage unit 100 is filled with the fluid.

[0049] The modular storage unit 100 may further include a first pair of clamp slots 122A, 122B and a second pair of clamp slots 122C, 122D that are disposed on the first and second panels 102 and 104, respectively. The first and second pair of clamp slots 122A-122D may be adapted to clamp the modular storage unit 100 to a surface. Each clamp slot of the first and second pair of clamp slots 122A-122D may be adapted to receive a clamp 124 (as shown later in FIG. 3) that is adapted to hold the modular storage unit 100 by the surface.

[0050] In some embodiments, the clamp 124 (as shown later in FIG. 3) may be a foldable structure such that the clamp 124 provides a flat base for the modular storage unit 100 to enable the modular storage unit 100 to be mounted on a flat surface.

[0051] The modular storage unit 100 may further include a first plurality of ribs 126A-126M and a second plurality of ribs 128A-128E. The first plurality of ribs 126A-126M and the second plurality of ribs 128A-128E may extend on a surface of each of the first and second panels 102 and 104. The first plurality of ribs 126A-126M may be horizontal ribs *i.e.*, the first plurality of ribs 126A-126M may extend along the lateral axis X-X' on the surface of the first and second panels 102 and 104 of the modular storage unit 100. The second plurality of ribs 128A-128E may be vertical ribs *i.e.*, the second plurality of ribs 128A-128E may extend along the longitudinal axis Y-Y' on the surface of the first and second panels 102 and 104 of the modular storage unit 100. The first plurality of ribs 126A-

126M and the second plurality of ribs 128A-128E may be adapted to add strength to the modular storage unit 100 and thereby avoiding deformation or deterioration of the modular storage unit 100.

[0052] FIG. 1C illustrates a top view of the modular storage unit 100 of FIG. 1A and FIG. 1B, in accordance with an embodiment herein. The modular storage unit 100 may further include a cavity 130. The cavity 130 may be defined between the first through fourth panels 102-108. Specifically, the cavity 130 may be defined between the first through sixth panels 102-112.

[0053] In some embodiments, holding capacity *i.e.*, volume of the cavity 130 may be in a range of 1000 litres and 4000 litres. Preferably, the volume of the cavity 130 of the modular storage unit 100 may be 1000 litres, 2000 litres, and 4000 litres.

[0054] In some embodiments, the cavity 130 of the modular storage unit 100 may be a single continuous cavity.

[0055] In some embodiments, the cavity 130 may be partitioned into a plurality of compartments (not shown). The plurality of compartments of the cavity 130 may be formed by providing a plurality of partition walls (not shown) within the cavity 130.

[0056] The modular storage unit 100 may further include one or more openings of which first through fourth openings 116A-116D are shown. The first through fourth openings 116A-116D may be disposed on the fifth panel 110. The first through fourth openings 116A-116D may allow an access to the cavity 130 from the fifth panel 110 such that the first through fourth openings 116A-116D facilitates to fill and/or removal the fluid from the cavity 130.

[0057] Although FIG. 1C illustrates that the modular storage unit 100 includes four openings (*i.e.*, the first through fourth openings 116A-116D), it will be apparent to a person skilled in the art that the scope of the present disclosure is not limited to it. In various other embodiments, the modular storage unit 100 may include more than four openings without deviating from the scope of the present disclosure. In such a scenario, each opening of the modular storage unit 100 is configured to serve one or more functionalities in a manner similar to the functionalities as served by the first through fourth openings 116A-116D as described herein.

[0058] The modular storage unit 100 may further include one or more lids of which first through fourth lids 118A-118D are shown. The first through fourth lids 118A-118D may have a cross-sectional shape similar to the cross-sectional shape of the first through fourth openings 116A-116D. Specifically, the first through fourth lids 118A-118D may be adapted to conceal the first through fourth openings 116A-116D, respectively. To conceal the first through fourth openings 116A-116D, the first through fourth lids 118A-118D may be aligned with the first through fourth openings 116A-116D, respectively, such that the first through fourth openings 116A-116D are covered by the first through fourth lids 118A-118D. The one

or more overflow holes 120 may be adapted to facilitate overflowing of the fluid while the cavity 130 of the modular storage unit 100 is filled.

[0059] Although FIG. 1C illustrates that the modular storage unit 100 includes four lids (*i.e.*, the first through fourth lids 118A-118D), it will be apparent to a person skilled in the art that the scope of the present disclosure is not limited to it. In various other embodiments, the modular storage unit 100 may include more than four openings without deviating from the scope of the present disclosure *i.e.*, the number of lids may be same to that of the number of openings of the modular storage unit 100. In such a scenario, each opening of the modular storage unit 100 is configured to serve one or more functionalities in a manner similar to the functionalities as served by the first through fourth lids 118A-118D as described herein.

[0060] In some embodiments, each lid 118A of the first through fourth lids 118A-118D may include first threads (not shown) and each opening 116A of the first through fourth openings 116A-116D may include second threads (not shown). To conceal the first through fourth openings 116A-116D, the first threads of the first through fourth lids 118A-118D may be engaged with the second threads of the first through fourth openings 116A-116D, respectively. This allows fastening of each lid 118A of the first through fourth lids 118A-118D to each corresponding opening 116A of the first through fourth openings 116A-116D. In some exemplary embodiments, the first threads may be disposed at an outer surface (not shown) of each lid 118A of the first through fourth lids 118A-118D and the second threads may be disposed at an inner surface (not shown) of each opening 116A of the first through fourth openings 116A-116D. In some other exemplary embodiments, the first threads may be disposed at an inner surface (not shown) of each lid 118A of the first through fourth lids 118A-118D and the second threads may be disposed at an outer surface (not shown) of each opening 116A of the first through fourth openings 116A-116D.

[0061] In some embodiments, each lid 118A of the first through fourth lids 118A-118D may be provided with a latching mechanism that facilitates locking of each lid 118A of the first through fourth lids 118A-118D. The locking of each lid 118A of the first through fourth lids 118A-118D by the latching mechanism prevents risk of theft of the one or more articles and fluid stored inside the cavity 130 of the modular storage unit 100.

[0062] In some embodiments, the first through fourth lids 118A-118D may have shape such as, but not limited to, square, circle, rectangle, and the like. Embodiments of the present disclosure are intended to include and/or otherwise cover any kind of the shape for the first through fourth lids 118A-118D without deviating from the scope of the present disclosure.

[0063] In some exemplary embodiments, the first and second through holes 114A and 114B may be adapted to entrain the fluid inside the cavity 130 of the modular storage unit 100. The third and fourth through holes 114C

and 114D may be adapted to drain the fluid outside from the cavity 130 of the modular storage unit 100. The first through fourth holes 114A-114D may be provided with a plurality of valves (not shown) to facilitate control of the fluid flow through the modular storage unit 100. To fill the cavity 130 of the modular storage unit 100, the plurality of valves for the first and second through holes 114A and 114B may be opened and the plurality of valves for the second and fourth through holes 114C and 114D may be closed to enable filling of the cavity 130 with the fluid. To drain the fluid from the cavity 130 of the modular storage unit 100, the plurality of valves of the first and second through holes 114A and 114B may be closed and the plurality of valves for the third and fourth through holes 114C and 114D may be opened to enable draining of the fluid from the cavity 130.

[0064] In some embodiments, the modular storage unit 100 may be adapted for bulk storage purposes. Specifically, the cavity 130 may be adapted to hold various kinds of fluid for storage purposes. The various type of fluid may include, but are not limited to, water, oil, gas, and the like. Embodiments of the present disclosure are intended to include and/or otherwise cover any type of the fluid that the cavity 130 can hold, without deviating from the scope of the present disclosure.

[0065] In some embodiments, the cavity 130 may be adapted to hold one or more articles. The one or more articles may include but not limited to grains, wheat, rice, pulses, slurries, edible agricultural products, non-edible agricultural products, and the like. Embodiments of the present disclosure are intended to include and/or otherwise cover any type of articles, whether edible or non-edible that can be held with the cavity 130, without deviating from the scope of the present disclosure.

[0066] In an exemplary embodiment, a fluid pump (not shown) may be installed inside the cavity 130 to facilitate easy removal of the fluid from the cavity 130 of the modular storage unit 100.

[0067] FIG. 2A and FIG. 2B illustrates a perspective view of a modular storage unit 200, in accordance with an embodiment herein. The modular storage unit 200 may be substantially similar to the modular storage unit 100, with like elements referenced with like reference numerals. However, the modular storage unit 200 may include first and second panels 202 and 204 that may be structurally different from the first and second panels 102 and 104 of the modular storage unit 100. Specifically, the first and second panels 202 and 204 may include a plurality of cut-outs 208 and 210, respectively, (*i.e.*, first pair of cut-outs 208A and 208B and second pair of cut-outs 210A and 210B) and the plurality of cut-outs 208 and 210 may define a cavity 212 between the first and second panels 202 and 204 such that the cavity 212 is structurally different from the cavity 130 of the modular storage unit 100. Furthermore, the modular storage unit 200 may be adapted to serve one or more functionalities that may be similar to the one or more functionalities of the modular storage unit 100 as described hereinabove, for example,

the modular storage unit 200 may be used to store and/or hold various kinds of fluids (for sake of brevity, herein referred to as "fluid"). The modular storage unit 200 may also be used for harvesting rainwater. By virtue of lighter weight of the modular storage unit 200, the modular storage unit 200 may be easily deployed at a construction site.

[0068] The modular storage unit 200 may include the first panel 202, the second panel 204, the third panel 106, the fourth panel 108, a fifth panel 206, and the sixth panel 112. The modular storage unit 200 may further include the longitudinal axis Y-Y' and the lateral axis X-X' as shown in direction index in FIG. 2A and FIG. 2B.

[0069] The first and second panels 202 and 204 may be disposed substantially parallel to each other. Specifically, the first and second panels 202 and 204 may extend along the longitudinal axis Y-Y' and the lateral axis X-X' of the modular storage unit 200.

[0070] The third and fourth panels 106 and 108 may be disposed substantially parallel to each other and substantially orthogonal to the first and second panels 202 and 204. The third and fourth panels 106 and 108 may extend along the longitudinal axis Y-Y' and the lateral axis X-X' of the modular storage unit 200.

[0071] The fifth and sixth panels 206 and 112 may be disposed substantially parallel to each other and orthogonal to the first and second panels 202 and 204 and the third and fourth panels 106 and 108. The fifth panel 206 may be disposed at an upper side of the first and second panels 202 and 204. The fifth panel 206 may extend along the longitudinal axis Y-Y' and the lateral axis X-X' of the modular storage unit 200. The sixth panel 112 may be disposed at a lower side of the first and second panels 202 and 204 of the modular storage unit 200. In some embodiments, the first panel 202, the second panel 204, the third panel 106, the fourth panel 108, a fifth panel 206, and the sixth panel 112 may have shape such as, but not limited to, a square, a rectangle, and the like. Embodiments of the present disclosure are intended to include and/or otherwise cover any type of shape for the first panel 202, the second panel 204, the third panel 106, the fourth panel 108, a fifth panel 206, and the sixth panel 112, without deviating from the scope of the present disclosure.

[0072] In some embodiments, a distance between the third and fourth panels 106, 108 along the lateral axis X-X' of the modular storage unit 200 *i.e.*, a length of the fifth panel 206 along the lateral axis X-X' of the modular storage unit 200 may lie in a range between 2000 millimeters (mm) and 2500 millimeters. Preferably, the distance between the third and fourth panels 106, 108 may be 2400 mm.

[0073] In some embodiments, distance between the fifth and sixth panels 206 and 112 along the longitudinal axis Y-Y' of the modular storage unit 200 *i.e.*, a length of the third and fourth panels 106 and 108 may lie in a range between 1500 mm and 2000 mm. Preferably, the distance between the fifth and sixth panels 206 and 112

may be 1980 mm.

[0074] In some embodiments, a distance between the first and second panels 202 and 204 *i.e.*, a width of the modular storage unit 200 may lie in a range between 450 mm and 500 mm. Preferably, the distance between the first and second panels 202 and 204 may be 465 mm.

[0075] In some embodiments, the first panel 202, the second panel 204, the third panel 106, the fourth panel 108, the fifth panel 206, and the sixth panel 112 may be made up of the material, such as, but not limited to, polyethylene, olefin, acrylonitrile butadiene styrene (ABS), polyamides, thermos-plastics, and the like. Embodiments of the present disclosure are intended to include and/or otherwise cover any type of the material for the modular storage unit 200 that is light in weight and can provide better heat and noise insulation, without deviating from the scope of the present disclosure.

[0076] In some embodiments, the modular storage unit 200 may be manufactured by the roto-moulding process. The roto-moulding process may provide requisite strength to the material of the modular storage unit 200. The roto-moulding process may allow the modular storage unit 200 to exhibit a single-body structure. Further, the roto-moulding process may ensure a uniform thickness of the modular storage unit 200. During fabrication of the modular storage unit 200 by roto-moulding process, the number of moulding pins may be used, which may improve the strength of the modular storage unit 200 against bulging or bulge loading.

[0077] In some embodiments, the modular storage unit 200 may be adapted to form a part of one of a building, a construction premises, and the like.

[0078] In some embodiments, the modular storage unit 200 may be used in one of solar heater plants, sewage treatment plants, other water purification systems, and the like.

[0079] In some embodiments, the modular storage unit 200 may include curved corners that may increase the wind resistance when the modular storage unit 200 is deployed in the areas having windy environment.

[0080] In some embodiments, the modular storage unit 200 may exhibit a single-body/uniform-body structure. The modular storage unit 200 may therefore be fabricated as a single piece.

[0081] In some embodiments, the first panel 202, the second panel 204, the third panel 106, the fourth panel 108, the fifth panel 206, and the sixth panel 112 of the modular storage unit 200 may be manufactured as discrete elements that may be assembled on site to form the modular storage unit 200. To assemble the modular storage unit 200, the first panel 202, the second panel 204, the third panel 106, the fourth panel 108, the fifth panel 206, and the sixth panel 112 may be coupled to each other to form the structure of the modular storage unit 200. The first panel 202, the second panel 204, the third panel 106, the fourth panel 108, the fifth panel 206, and the sixth panel 112 may be removably coupled to each other that allows the modular storage unit 200 to

be disassembled at the time of transportation of the modular storage unit 200 to the construction site.

[0082] In some embodiments, the modular storage unit 200 may be light in weight. The modular storage unit 200 may be portable that facilitates easy transportation of the modular storage unit 200. In some embodiments, the modular storage unit 200 may be pre-moulded and pre-coloured. In some embodiments, the modular storage unit 200 may require less space than the conventional storage units, while the modular storage unit 200 is being deployed at the site.

[0083] The modular storage unit 200 may further include the plurality of through holes 114 of which first through fourth through holes 114A-114D are shown. The first and second through holes 114A and 114B of the first through fourth through holes 114A-114D may be disposed on the third panel 106. The third and fourth through holes 114C, 114D of the first through fourth through holes 114A-114D may be disposed on the fourth panel 108. The first through fourth through holes 114A-114D may be adapted to drain fluid from the modular storage unit 200. The first through fourth through holes 114A-114D may further be adapted to couple an adjacent modular storage unit that is substantially similar to the modular storage unit 200, to the modular storage unit 200.

[0084] The modular storage unit 200 may further include the one or more overflow holes 120 that are disposed on either the third panel 106 or the fourth panel 108, or both. The one or more overflow holes 120 may be adapted to facilitate overflow of the fluid when the modular storage unit 200 is filled with the fluid.

[0085] The modular storage unit 200 may further include the first pair of clamp slots 122A, 122B and the second pair of clamp slots 122C, 122D that are disposed on the first and second panels 202 and 204, respectively. The first and second pair of clamp slots 122A-122D may be adapted to clamp the modular storage unit 200 to the surface. Each clamp slot of the first and second pair of clamp slots 122A-122D may be adapted to receive the clamp 124 (as shown later in FIG. 3) that is adapted to hold the modular storage unit 200 by the surface.

[0086] In some embodiments, the clamp 124 (as shown later in FIG. 3) may be the foldable structure such that the clamp 124 provides the flat base for the modular storage unit 200 to enable the modular storage unit 200 to be mounted on the flat surface.

[0087] The modular storage unit 200 may further include a first plurality of ribs 126A-126M, a plurality of grooves 207 of which first through tenth grooves 207A-207N are shown, and a plurality of projections 209 of which first through tenth projections 209A-209N are shown. The first plurality of ribs 126A-126M and the second plurality of ribs 128A-128E may extend on a surface of each of the first panel 202, the second panel 204, the third panel 106, and the fourth panel 108. The first plurality of ribs 126A-126M may be horizontal ribs. The first through tenth grooves 207A-207N and the first through tenth projections 209A-209N may be disposed at a lower

side of the first and second panels 202 and 204. Specifically, the first through tenth grooves 207A-207N may be formed between the first through tenth projections 209A-209N. The first through tenth grooves 207A-207N and the first through tenth projections 209A-209N may extend in the longitudinal axis Y-Y'. The first plurality of ribs 126A-126M and the second plurality of ribs 128A-128E may be adapted to add strength to the modular storage unit 200 and thereby avoiding deformation or deterioration of the modular storage unit 200. The first through tenth grooves 207A-207N and the first through tenth projections 209A-209N may be adapted to add stability to the modular storage unit 200 when the modular storage unit 200 is supported on a surface. Furthermore, the first through tenth grooves 207A-207N and the first through tenth projections 209A-209N may prevent bulging of the lower side of the first panel 202, the second panel 204, the third panel 106, and the fourth panel 108.

[0088] FIG. 2C illustrates a top view of the modular storage unit 200 of FIG. 2A and FIG. 2B, in accordance with an embodiment herein. The modular storage unit 200 may further include the cavity 212. The cavity 212 may be defined between the first panel 202, the second panel 204, the third panel 106, and the fourth panel 108. Specifically, the cavity 212 may be defined between the first panel 202, the second panel 204, the third panel 106, the fourth panel 108, the fifth panel 206, and the sixth panel 112.

[0089] In some embodiments, holding capacity i.e., volume of the cavity 212 may be in a range of 1500 litres and 2500 litres. Preferably, the volume of the cavity 212 of the modular storage unit 200 may be 2000 litres.

[0090] In some embodiments, the cavity 212 of the modular storage unit 200 may be a continuous spiral cavity.

[0091] In some embodiments, the cavity 212 may be partitioned into a plurality of compartments (not shown). The plurality of compartments of the cavity 212 may be formed by providing a plurality of partition walls (not shown) within the cavity 212.

[0092] The modular storage unit 200 may further include one or more openings of which first and second openings 214A and 214B are shown. The first and second openings 214A and 214B may be disposed on the fifth panel 206. The first and second openings 214A and 214B may allow an access to the cavity 212 from the fifth panel 206 such that the first and second openings 214A and 214B facilitates filling and removal of the fluid from the cavity 212.

[0093] Although FIG. 2C illustrates that the modular storage unit 200 includes two openings (i.e., the first and second openings 214A and 214B), it will be apparent to a person skilled in the art that the scope of the present disclosure is not limited to it. In various other embodiments, the modular storage unit 200 may include more than two openings without deviating from the scope of the present disclosure. In such a scenario, each opening of the modular storage unit 200 is configured to serve

one or more functionalities in a manner similar to the functionalities as served by the first and second openings 214A and 214B as described herein.

[0094] The modular storage unit 200 may further include one or more lids of which first and second lids 216A and 216B are shown. The first and second lids 216A and 216B may have a cross-sectional shape similar to the cross-sectional shape of the first and second openings 214A and 214B. Specifically, the first and second lids 216A and 216B may be adapted to conceal the first and second openings 214A and 214B, respectively. To conceal the first and second openings 214A and 214B, the first and second lids 216A and 216B may be aligned with the first and second openings 214A and 214B, respectively, such that the first and second openings 214A and 214B are covered by the first and second lids 216A and 216B. The one or more overflow holes 120 may be adapted to facilitate overflowing of the fluid while the cavity 212 of the modular storage unit 200 is filled.

[0095] Although FIG. 2A and 2B illustrates that the modular storage unit 200 includes two lids (*i.e.*, the first and second lids 216A and 216B), it will be apparent to a person skilled in the art that the scope of the present disclosure is not limited to it. In various other embodiments, the modular storage unit 200 may include more than two lids without deviating from the scope of the present disclosure *i.e.*, the number of lids may be same to that of the number of openings of the modular storage unit 200. In such a scenario, each lid of the modular storage unit 200 is configured to serve one or more functionalities in a manner similar to the functionalities as served by the first and second lids 216A and 216B as described herein.

[0096] In some embodiments, each lid 216A of the first and second lids 216A and 216B may include first threads (not shown) and each opening 214A of the first and second openings 214A and 214B may include second threads (not shown). To conceal the first and second openings 214A and 214B, the first threads of the first and second lids 216A and 216B may be engaged with the second threads of the first and second openings 214A and 214B, respectively. This allows fastening of each lid 216A of the first and second lids 216A and 216B to each corresponding opening 214A of the first and second openings 214A and 214B. In some exemplary embodiments, the first threads may be disposed at an outer surface (not shown) of each lid 216A of the first and second lids 216A and 216B and the second threads may be disposed at an inner surface (not shown) of each opening 214A of the first and second openings 214A and 214B. In some other exemplary embodiments, the first threads may be disposed at an inner surface (not shown) of each lid 216A of the first and second lids 216A and 216B and the second threads may be disposed at an outer surface (not shown) of each opening 214A of the first and second openings 214A and 214B.

[0097] In some embodiments, each lid 216A of the first and second lids 216A and 216B may be provided with a

latching mechanism that facilitates locking of each lid 216A of the first and second lids 216A and 216B. The locking of each lid 216A of the first and second lids 216A and 216B by the latching mechanism prevents risk of theft of the one or more articles and fluid stored inside the cavity 212 of the modular storage unit 200.

[0098] In some embodiments, the first and second lids 216A and 216B may have shape such as, but not limited to, square, circle, rectangle, and the like. Embodiments of the present disclosure are intended to include and/or otherwise cover any kind of the shape for the first and second lids 216A and 216B without deviating from the scope of the present disclosure.

[0099] In some exemplary embodiments, the first and second through holes 114A and 114B may be adapted to entrain the fluid inside the cavity 212 of the modular storage unit 200. The third and fourth through holes 114C and 114D may be adapted to drain the fluid outside from the cavity 212 of the modular storage unit 200. The first through fourth holes 114A-114D may be provided with a plurality of valves (not shown) to facilitate control of the fluid flow through the modular storage unit 200. To fill the cavity 212 of the modular storage unit 200, the plurality of valves for the first and second through holes 114A and 114B may be opened and the plurality of valves for the second and fourth through holes 114C and 114D may be closed to enable filling of the cavity 212 with the fluid. To drain the fluid from the cavity 212 of the modular storage unit 200, the plurality of valves of the first and second through holes 114A and 114B may be closed and the plurality of valves for the third and fourth through holes 114C and 114D may be opened to enable draining of the fluid from the cavity 212.

[0100] In some embodiments, the modular storage unit 200 may be adapted for bulk storage purposes. Specifically, the cavity 212 may be adapted to hold various kinds of fluid for storage purposes. The various type of fluid may include, but are not limited to, water, oil, gas, and the like. Embodiments of the present disclosure are intended to include and/or otherwise cover any type of the fluid that the cavity 212 can hold, without deviating from the scope of the present disclosure.

[0101] In some embodiments, the cavity 212 may be adapted to hold one or more articles. The one or more articles may include but not limited to grains, wheat, rice, pulses, slurries, edible agricultural products, non-edible agricultural products, and the like. Embodiments of the present disclosure are intended to include and/or otherwise cover any type of articles, whether edible or non-edible that can be held with the cavity 212, without deviating from the scope of the present disclosure.

[0102] In an exemplary embodiment, a fluid pump (not shown) may be installed inside the cavity 212 to facilitate easy removal of the fluid from the cavity 212 of the modular storage unit 200.

[0103] Referring now again to FIG. 2A and FIG. 2B, the plurality of cut-outs 208 and 210 may be formed on the first panel 202 and the second panel 204 when the

cavity 212 is continuous spiral cavity. Specifically, the first pair of cut-outs 208A and 208B may be formed on the first panel 202 and the second pair of cut-outs 210A and 210B may be formed on the second panel 204 of the modular storage unit 200. The first pair of cut-outs 208A and 208B may extend along the longitudinal axis Y-Y' of the modular storage unit 200.

[0104] Although FIG. 2A and FIG. 2B illustrate that the modular storage unit 200 includes two pair of cut-outs (*i.e.*, the first and second pair of cut-outs 208A, 208B, 210A, 210B), it will be apparent to a person skilled in the art that the scope of the present disclosure is not limited to it. In various other embodiments, the modular storage unit 200 may include more than two pair of cut-outs without deviating from the scope of the present disclosure. In such a scenario, each pair of cut-outs is configured to perform one or more operations in a manner similar to the operations of the first and second pair of cut-outs 208A, 208B, 210A, 210B as described herein.

[0105] The first and second pair of cut-outs 208A, 208B, 210A, 210B may be adapted to add stability when the modular storage unit 200 is used at high-rise applications or in windy applications. The first and second pair of cut-outs 208A, 208B, 210A, 210B ensure less drag force to be exerted on the modular storage unit 200 as the first and second pair of cut-outs 208A, 208B, 210A, 210B allows wind to pass through the modular storage unit 200 and thereby maintaining the stability of the modular storage unit 200. For example, the first and second pair of cut-outs 208A, 208B, 210A, 210B may deflect the modular storage unit 100 and 200 by about 4.99 mm when the modular storage unit 100 and 200 is clamped on the surface by the clamps 124 and subjected to wind having speed of about 18 Kilometre per hour (Kmph). In some examples, the first and second pair of cut-outs 208A, 208B, 210A, 210B may deflect the modular storage unit 100 and 200 by about 19.94 mm when the modular storage unit 100 and 200 is clamped on the surface by the clamps 124 and subjected to stormy weather conditions having wind speed of about 40 Kmph.

[0106] The plurality of cut-outs 208 and 210 may form a plurality of conical frustum shaped webs 218 of which first and second conical frustum shaped webs 218A and 218B are shown in FIG. 2C. Each conical frustum shaped web 218A of the first and second conical frustum shaped webs 218A and 218B may span the distance between the first and second panels 202 and 204.

[0107] The first and second conical frustum shaped webs 218A and 218B may be adapted to avoid or prevent squeezing/bulging of the modular storage unit 200, while the modular storage unit 200 holds the fluid. Therefore, the first and second conical frustum shaped webs 218A and 218B may be adapted to maintain desired distance between the first and second panels 202 and 204. For example, the first and second conical frustum shaped webs 218A and 218B may deform the modular storage unit 100 and 200 by about 23.9 mm when the modular storage unit 100 and 200 is fully filled with water.

[0108] Although FIG. 2C illustrates that the modular storage unit 200 includes two webs (*i.e.*, the first and second conical frustum shaped webs 218A and 218B), it will be apparent to a person skilled in the art that the scope of the present disclosure is not limited to it. In various other embodiments, the modular storage unit 200 may include more than two webs without deviating from the scope of the present disclosure. In such a scenario, each web of the plurality of webs is configured to serve one or more functionalities in a manner similar to the functionalities as served by the first and second conical frustum shaped webs 218A and 218B as described herein.

[0109] FIG. 3 illustrates a perspective view of a modular construction 300, in accordance with an embodiment herein. The modular construction 300 may include a plurality of modular storage units 200A-200N that may be coupled to each other. The modular construction 300 may be adapted for bulk storage of the fluid. By virtue of lightweight of the modular storage unit 200, the modular construction 300 is light in weight. The modular construction 300 may be carried from one place to another that makes the modular construction 300 portable.

[0110] Although FIG. 3 illustrates that the modular construction 300 is fabricated by interconnection of the plurality of modular storage units 200A-200N, it will be apparent to a person skilled in the art that the scope of the present disclosure is not limited to it. In various other embodiments, the modular construction 300 may be fabricated by interconnection of the plurality of modular storage units 100A-100N without deviating from the scope of the present disclosure. In such a scenario, the modular construction 300 may exhibit similar shape and size to that of the modular construction 300 that is fabricated by interconnection of the plurality of modular storage units 200A-200N. Furthermore, the modular construction 300 fabricated by interconnection of the plurality of modular storage units 100A-100N is configured to serve similar/same functionalities/utilities to that of the modular construction 300 that is fabricated by interconnection of the plurality of modular storage units 200A-200N as described herein.

[0111] In some embodiments, the modular construction 300 may be deployed as a rainwater harvester. The first through fourth openings 116A-116D of the modular storage unit 200A, of the plurality of modular storage units 200A-200N of the modular construction 300 may be accessed, by way of removing the one or more lids 118A-118D from the first through fourth openings 116-116D, to receive rainwater. In an example, the one or more lids 118A-118D may be operated remotely such that an operator may be adapted to open the one or more lids 118A-118D remotely during an event of rainfall. In another example, a plurality of climate sensors (not shown) may be disposed on the modular construction 300 such that upon detection of rainy events, the plurality of climate sensors generates rain alert signal on a user device of the operator. The operator, upon generation of the rain alert sig-

nal, may be adapted to open the one or more lids 118A-118D remotely. The modular construction 300 thereby eliminates the need of conventionally used separate water tanks that consumes a lot of space and having a rigid structure that makes the water tanks difficult to transport and modifying them as per the requirements.

[0112] The modular construction 300 may include one or more connectors 302A-302N that are to be inserted in at least one of the first through fourth through holes 114A-114D to assemble the modular construction 300. To assemble the modular construction 300, the one or more connectors 302A-302N may be adapted to interconnect one modular storage unit 200A of the plurality of modular storage units 200A-200N to another modular storage unit 200B of the plurality of modular storage units 200A-200N. Specifically, the one or more connectors 302A-302N may be adapted to couple adjacent modular storage units of the plurality of modular storage units 200A-200N. Upon assembling the modular construction 300, the first pair of clamp slots 122A, 122B and the second pair of clamp slots 122C, 122D of each modular storage unit 200A of the plurality of modular storage units 200A-200N may be adapted to clamp the modular construction 300 to the surface. In order to clamp the modular construction 300 to the surface each clamp slot of the first and second pair of clamp slots 122A-122D may be adapted to receive the clamp 124 (as shown later in FIG. 3). The clamp 124 (as shown later in FIG. 3) may be adapted to hold each modular storage unit 200A, of the plurality of modular storage units 200A-200N by the surface that facilitates clamping of the modular construction 300 to the surface.

[0113] The one or more connectors 302A-302N allows easy assembly of the modular construction 300 at any site. The one or more connectors 302A-302N allows quick interconnection the plurality of modular storage units 200A-200N with each other.

[0114] In some embodiments, the one or more connectors 302A-302N may be male thread adapters. The male thread adapters may exhibit one of a straight shape, T-shape, and curve-shape.

[0115] In some embodiments, the one or more connectors 302A-302N may be one of an elbow assembly, ball valve assembly, and interconnector pipe. The diameter of the one or more connectors 302A-302N may lie in a range between 0.5 inches and 1.5 inches. Preferably, the diameter of the one or more connectors 302A-302N may be 1 inch. The length of the one or more connectors 302A-302N may lie in a range between 130 mm and 150 mm. Preferably, the length of the one or more connectors 302A-302N may be 134 mm.

[0116] In some embodiments, the modular construction 300 may exhibit multiple shapes by changing the configuration of each modular storage unit of the plurality of modular storage units 200A-200N in the modular construction 300. Different shapes of the modular construction 300 may be obtained by changing the plurality of modular storage units 200A-200N in different directions

of the modular construction 300. The change in the shape of the modular construction 300 may be facilitated by the one or more connectors 302A-302N. The one or more connectors 302A-302N may facilitate modification in interconnection of the plurality of modular storage units 200A-200N that allows the modular construction 300 to exhibit various shapes. The one or more connectors 302A-302N may therefore allow the interconnection of the plurality of modular storage units 200A-200N in flexible manner. The flexibility in shape of the modular construction 300 may facilitate the modular construction 300 to be deployed in any space/region. The flexibility in the shape of the modular construction 300 may increase the capacity of holding the fluid. The flexibility in the shape of the modular construction 300 allows change in shape of the modular construction 300 based on the bulk storage requirements.

[0117] In some embodiments, the sixth panel 112 of the modular storage unit 200 may include one or more lower openings (not shown). The modular storage unit 200A may be stacked onto another modular storage unit 200B such that the one or more lower openings of modular storage unit 200A aligns with the first through fourth openings 116A-116D of another modular storage unit 200B. The alignment of the one or more lower openings of the modular storage unit 200A with the first through fourth openings 116A-116D of another modular storage unit 200B allow storage of the fluid in either of the modular storage units 200A, 200B.

[0118] In some embodiments, width of the modular construction 300 may lie in a range between 1500 millimeters and 2000 milli-meters. Preferably, the width of the modular construction 300 may be 1800 milli-meters.

[0119] In some embodiments, length of the modular construction 300 may lie in a range between 5000 millimeters and 5500 milli-meters. Preferably, the length of the modular construction 300 may be 5350 milli-meters.

[0120] In some embodiments, the modular construction 300 may have wind-resistant design and may be highly durable.

[0121] In some embodiments, the modular construction 300 may be ultra-violet resistant. The modular construction 300 may be treated with nano-silver technology for anti-bacterial growth.

[0122] In some embodiments, the modular construction 300 may be a water storage tank (not shown). The water storage tank may be deployed at the height of 10 meters to 15 meters from a surface. To enable cleaning of the water storage tank, the water storage tank may be provided with a clean water inlet (not shown) and a dirty water outlet (not shown). To enable cleaning of the water storage tank, the clean water inlet may be adapted to allow entrainment of clean water inside the water storage tank and the dirty water outlet may be adapted to allow ejection of the dirty water from the modular construction. In some examples, the water storage tank may be cleaned by virtue of a water jet. In some examples, the water holding capacity of the water tank may lie in a range

between 15000 litres and 20000 litres. Preferably, the water holding capacity of the water storage tank may be 16000 litres.

[0123] FIG. 4A-4G illustrates various configurations of the modular construction 300. The one or more connectors 302A-302N may allow the modular construction 300 to exhibit any customizable shape (as shown in FIG. 4A-4G).

[0124] FIG. 4A illustrates a block-chain configuration 400A of the modular construction 300, in accordance with an embodiment herein. In some exemplary embodiments, the block-chain configuration 400A of the modular construction 300 may be fabricated by using 45 number of modular storage units 200. The block-chain configuration 400A of the modular construction 300 may have fluid holding capacity that may lie in a range between 80000 litres and 100000 litres. Preferably, the fluid holding capacity of the block-chain configuration of the modular construction 300 may be 90000 litres.

[0125] FIG. 4B illustrates a T-link configuration 400B of the modular construction 300, in accordance with an embodiment herein. FIG. 4C illustrates an X-link configuration 400C of the modular construction 300, in accordance with an embodiment herein. FIG. 4D illustrates a 7-link configuration 400D of the modular construction 300, in accordance with an embodiment herein. FIG. 4E illustrates an open link configuration 400E of the modular construction 300, in accordance with an embodiment herein. FIG. 4F illustrates an off-set tank configuration 400F of the modular construction 300, in accordance with an embodiment herein. The configurations 400A-400F of the modular construction 300 may be deployed as a storage grid for bulk storage purposes. Further, the configurations 400A-400F may be deployed as a fence for fencing to protect an area that is engulfed inside the modular construction 300.

[0126] FIG. 4G illustrates a decorative piece configuration 400G of the modular construction 300, in accordance with an embodiment herein. The decorative piece configuration 400G may include a conduit 402 and a plurality of plants 404 of which first through sixth plants 404A-404F are shown. The conduit 402 may extend through the first and second pair of cut-outs 208A, 208B, 210A, 210B of each modular storage unit 200 of the plurality of modular storage units 200A-200N. The first through sixth plants 404A-404F may be disposed on the conduit 402.

[0127] In some embodiments, the conduit 402 may allow passage of water that allows watering of the first through sixth plants 404A-404F.

[0128] In some embodiments, the decorative piece configuration 400G may be deployed as an aquarium such that the modular storage unit 200 is transparent. The cavity 130 of the modular storage unit 200 may provide a thriving space for number of fishes and other kind of water-animals present in the aquarium. In some examples, the aquarium may also be habitable for a plurality of water plants.

[0129] In some embodiments, the modular storage unit 200 of the decorative piece configuration 400G may be pre-painted or pre-coloured. In an example, the modular storage unit 200 of the decorative piece configuration 400G may be customized in terms of colour whenever required.

[0130] Although FIG. 4A-4G illustrates various configurations of the modular construction 300 that is fabricated by interconnection of the plurality of modular storage unit 200A-200N, it will be apparent to a person skilled in the art that the scope of the present disclosure is not limited to it. In various other embodiments, the various configurations of the modular construction 300 may be fabricated by interconnection of the plurality of modular storage units 200A-200N without deviating from the scope of the present disclosure. In such a scenario, various configurations of the modular construction 300 may exhibit similar shape and size to that of various configurations of the modular construction 300 that is fabricated by interconnection of the plurality of modular storage units 200A-200N. Furthermore, various configurations of the modular construction 300 that is fabricated by interconnection of the plurality of modular storage units 200A-200N is configured to perform one or more operations in a manner similar to the operations of various configurations of the modular construction 300 that is fabricated by interconnection of the plurality of modular storage units 200A-200N as described herein. Thus, the modular storage unit 100 and 200 may provide following advantages that may be derived from the structural and functional embodiments of the modular storage unit 100 and 200: -

- The modular storage unit 100 and 200 is a light-weight wall that allows easy transportation of the modular storage unit 100 and 200.
- The modular storage unit 100 and 200 is capable of forming the modular construction 300 of various configurations.
- By virtue of flexibility in the modular construction 300, the modular construction 300 is capable of holding large quantity of articles while consuming less space.
- The modular construction 300 forms an efficient storage system.
- By virtue of light-weight of the modular construction 300, the modular construction 300 can be carried easily from one place to another.
- The modular storage unit 100 and 200 due to their slim design require very less space while installation in various applications of storage.
- The modular construction 300 is aerodynamically and structurally stable which allows the usage of the modular construction 300 in windy areas.
- The modular construction 300 is easy to clean.
- The modular construction 300 has high wind resistant and drag resistant.
- The modular construction 300 is capable of providing continuous supply of water.
- The first and second conical frustum shaped webs

218A and 218B prevents bulging or deformation of the modular storage unit 100 and 200.

- The first and second pair of cut-outs 208A, 208B, 210A, 210B and the first and second conical frustum shaped webs 218A and 218B are easy to manufacture by roto molding process. 5
- The roto-molding process for manufacturing of the modular storage unit 100 and 200 reduces the manufacturing/fabrication time for the modular storage unit 100 and 200. 10
- Easy maintenance of the modular construction 300 that allows easy replacement of a faulty modular storage unit 100 and 200 from the modular construction 300 so that the faulty modular storage unit 100 and 200 can be replaced by another modular storage unit 100 and 200. 15

[0131] The foregoing discussion of the present disclosure has been presented for purposes of illustration and description. It is not intended to limit the present disclosure to the form or forms disclosed herein. In the foregoing Detailed Description, for example, various features of the present disclosure are grouped together in one or more embodiments, configurations, or embodiments for the purpose of streamlining the disclosure. The features of the embodiments, configurations, or embodiments may be combined in alternate embodiments, configurations, or embodiments other than those discussed above. This method of disclosure is not to be interpreted as reflecting an intention the present disclosure requires more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive embodiments lie in less than all features of a single foregoing disclosed embodiment or configuration. Thus, the following claims are hereby incorporated into this Detailed Description, with each claim standing on its own as a separate embodiment of the present disclosure. 20

[0132] Moreover, though the description of the present disclosure has included description of one or more embodiments, configurations, or embodiments and certain variations and modifications, other variations, combinations, and modifications are within the scope of the present disclosure, e.g., as may be within the skill and knowledge of those in the art, after understanding the present disclosure. It is intended to obtain rights which include alternative embodiments, configurations, or embodiments to the extent permitted, including alternate, interchangeable and/or equivalent structures, functions, ranges or steps to those claimed, whether or not such alternate, interchangeable and/or equivalent structures, functions, ranges or steps are disclosed herein, and without intending to publicly dedicate any patentable subject matter. 25 30 35 40 45 50

Claims

1. A modular storage unit (200) comprising:

first and second panels (202, 204) disposed substantially parallel to each other;
third and fourth panels (106, 108) disposed substantially parallel to each other and substantially orthogonal to the first and second panels (202, 204);
a cavity (212) defined between the first panel (102, 202), the second panel (104, 204), the third panel (106) and the fourth panel (108);
a plurality of through holes (114), wherein first and second through holes (114A, 114B) of the plurality of through holes (114) are disposed on the third panel (106) and third and fourth through holes (114C, 114D) of the plurality of through holes (114) are disposed on the fourth panel (108).

2. The modular storage unit (200) as claimed in claim 1, further comprising first and second pair of clamp slots (122A-122D) disposed on the first and second panels (202, 204), respectively, to clamp the modular storage unit (100, 200) to a surface. storage
3. The modular storage unit (200) as claimed in claim 1, wherein the cavity (212) is a continuous spiral cavity. 25
4. The modular storage unit (200) as claimed in claim 4, wherein, when the cavity (212) is the continuous spiral cavity, the first and second panels (202, 204) comprises first and second pair of cut outs (208A, 208B, 210A, 210B), respectively, such that the first and second pair of cut outs (208A, 208B, 210A, 210B) form a plurality of conical frustum shaped webs (218A, 218B) between the first and second panels (202, 204). 30 35
5. The modular storage unit (200) as claimed in claim 1, further comprising a fifth panel (110, 206) and a sixth panel (112) that are disposed substantially parallel to each other and orthogonal to the first and second panels (202, 204) and the third and fourth panels (106, 108). 40
6. The modular storage unit (200) as claimed in claim 6, further comprising (i) one or more openings (214A, 214B) that are disposed on the fifth panel (206) and (ii) one or more lids (216A, 216B) adapted to conceal the one or more openings (214A, 214B). 45 50
7. The modular storage unit (200) as claimed in claim 1, further comprising one or more overflow holes (120) disposed on one of, the third panel (106) and the fourth panel (108). 55
8. The modular storage unit (200) as claimed in claim 1, wherein the plurality of through holes (114) are

adapted to (i) drain fluid from the modular storage unit (200) and (ii) couple an adjacent modular storage unit that is substantially similar to the modular storage unit (200), to the modular storage unit (200).

9. A modular construction (300) comprising:
a plurality of modular storage units (200A-200N) coupled to each other, wherein each modular storage unit of the plurality of modular storage units (200A-200N) comprising:

first and second panels (202, 204) disposed substantially parallel to each other;
third and fourth panels (106, 108) disposed substantially parallel to each other and substantially orthogonal to the first and second panels (202, 204);

a cavity (212) defined between the first panel (202), the second panel (204), the third panel (106) and the fourth panel (108);

a plurality of through holes (114), wherein first and second through holes (114A, 114B) of the plurality of through holes (114) are disposed on the third panel (106) and third and fourth through holes (114C, 114D) of the plurality of through holes (114) are disposed on the fourth panel (108), wherein the plurality of through holes (114) are adapted to couple adjacent modular storage units of the plurality of modular storage units (200A-200N).

10. The modular construction (300) as claimed in claim 10, further comprising one or more connectors (302A-302N) adapted to be inserted in at least one of the pluralities of through holes (114) to couple adjacent modular storage units of the plurality of modular storage units (200A-200N).

11. The modular construction (300) as claimed in claim 10, wherein each modular storage units of the plurality of modular storage units (200A-200N) further comprising first and second pair of clamp slots (122A-122D) disposed on the first and second panels (202, 204), respectively, to clamp the modular construction (300) to a surface.

12. The modular construction (300) as claimed in claim 12, wherein to clamp the modular construction (300) to the surface, each clamp slot of the first and second pair of clamp slots (122A-122D) is adapted to receive a clamp (124) such that the clamp (124) holds each modular storage unit (200A) of the plurality of modular storage units (200A-200N) by the surface.

13. The modular construction (300) as claimed in claim 10, wherein the cavity (212) is a continuous spiral cavity.

14. The modular construction (300) as claimed in claim 15, wherein, when the cavity (212) is the continuous spiral cavity, the first and second panels (202, 204) comprises first and second pair of cut outs (208A, 208B, 210A, 210B), respectively, such that the first and second pair of cut outs (208A, 208B, 210A, 210B) form a plurality of conical frustum shaped webs (218A, 218B) between the first and second panels (202, 204).

15. The modular construction (300) as claimed in claim 10, wherein each modular storage unit of the plurality of modular storage units (200A-200N) further comprising a fifth panel (206) and a sixth panel (112) that are disposed substantially parallel to each other and orthogonal to the first and second panels (202, 204) and the third and fourth panels (106, 108).

16. The modular construction (300) as claimed in claim 10, wherein each modular storage unit of the plurality of modular storage units (200A-200N) further comprising (i) one or more openings (214A, 214B) that are disposed on the fifth panel (206) and (ii) one or more lids (216A, 216B) adapted to conceal the one or more openings (214A, 214B).

17. The modular construction (300) as claimed in claim 10, wherein each modular storage unit of the plurality of modular storage units (200A-200N) further comprising one or more overflow holes (120) disposed on one of, the third panel (106) and the fourth panel (108).

18. The modular construction (300) as claimed in claim 10, wherein the plurality of through holes (114) of each modular storage unit of the plurality of modular storage units (200A-200N) are further adapted to drain fluid.

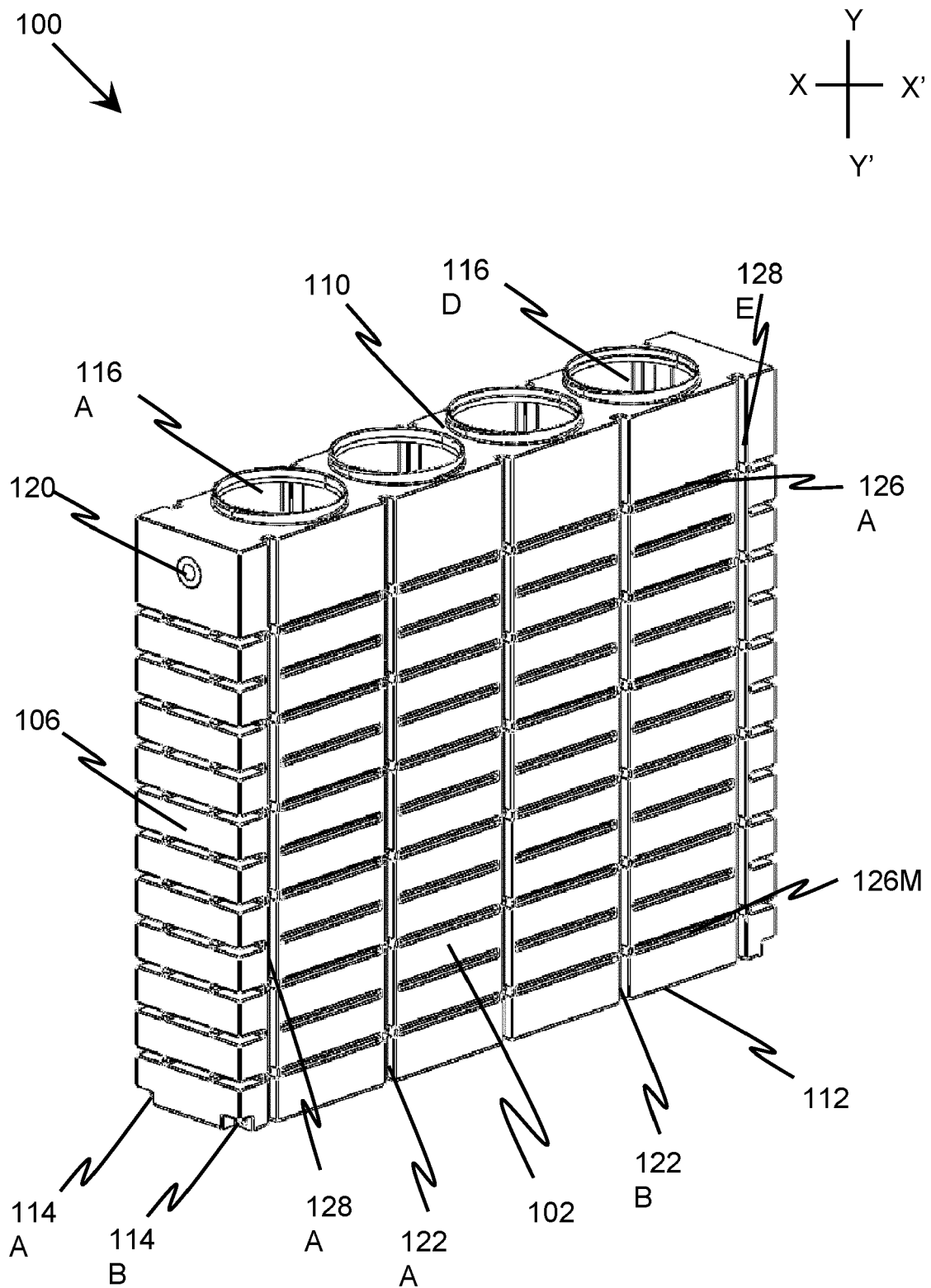


FIG. 1A

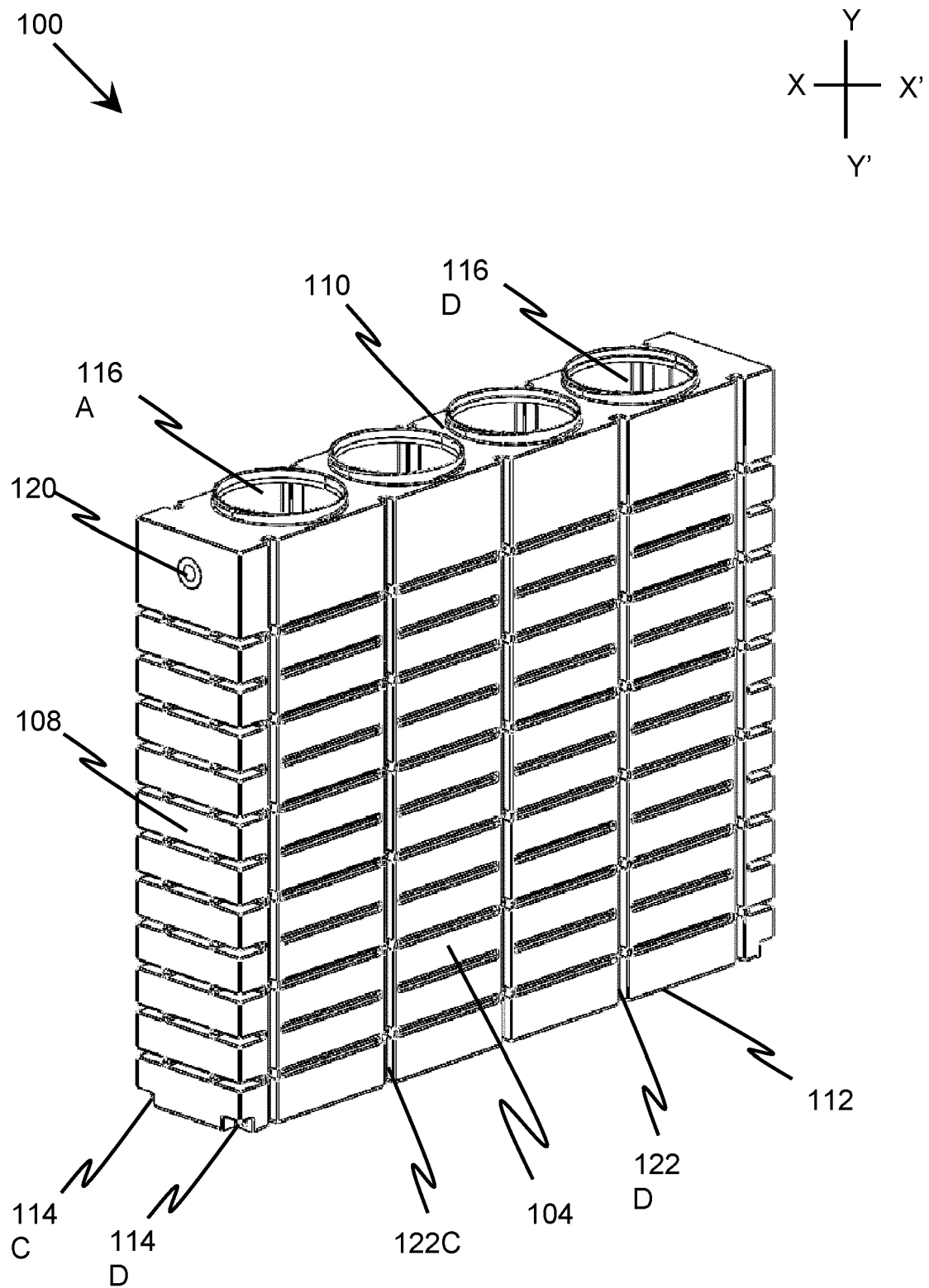


FIG. 1B

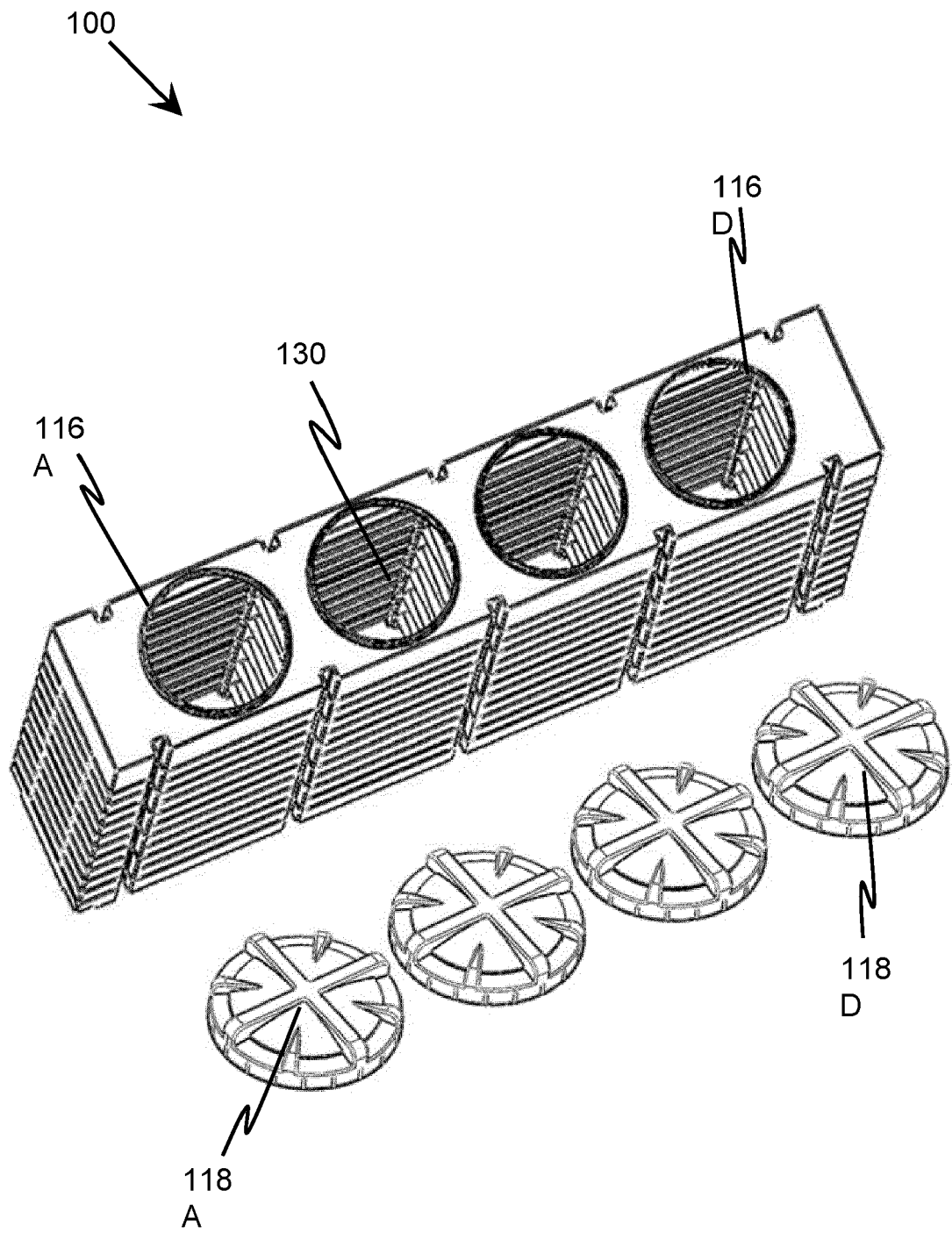


FIG. 1C

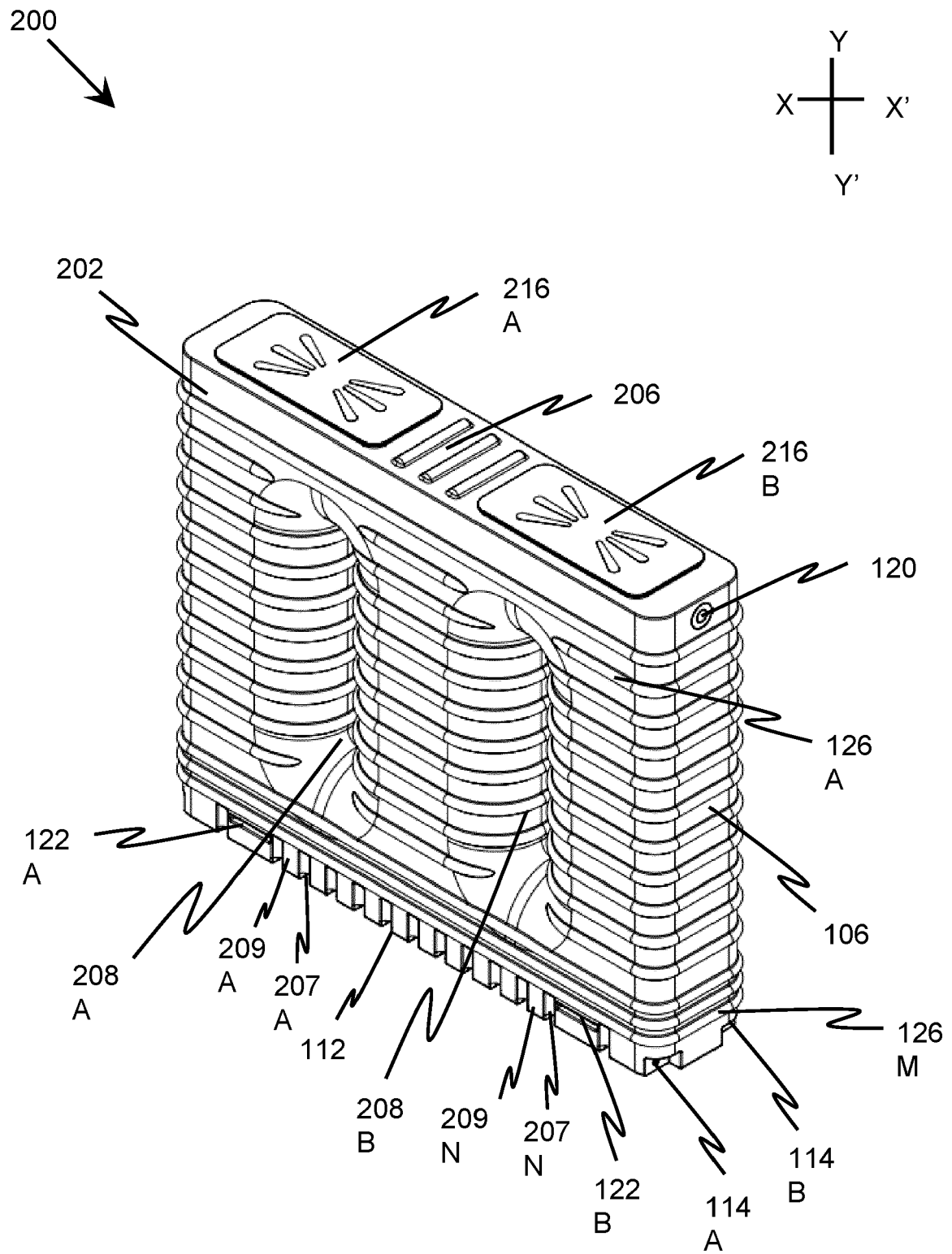


FIG. 2A

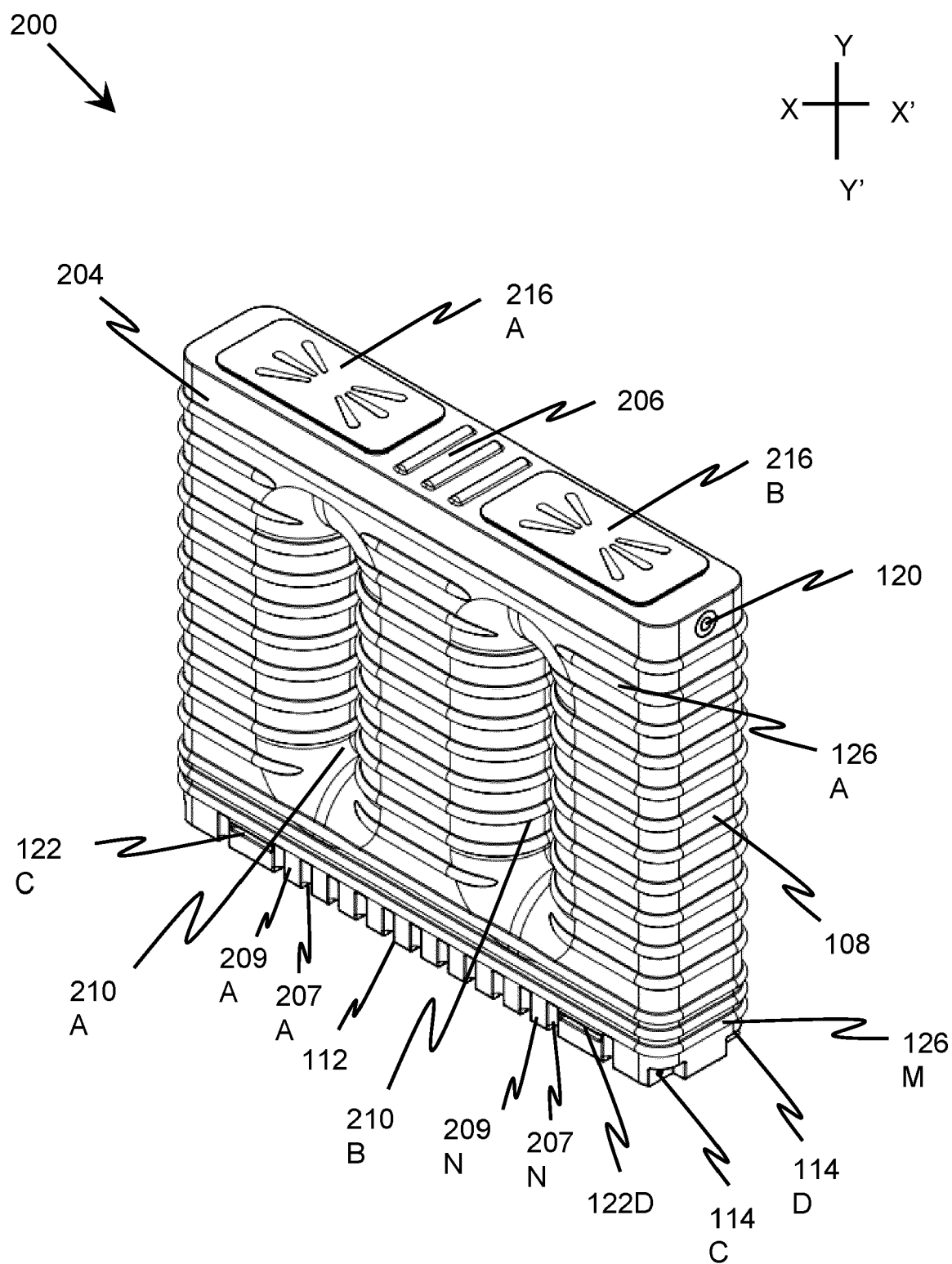


FIG. 2B

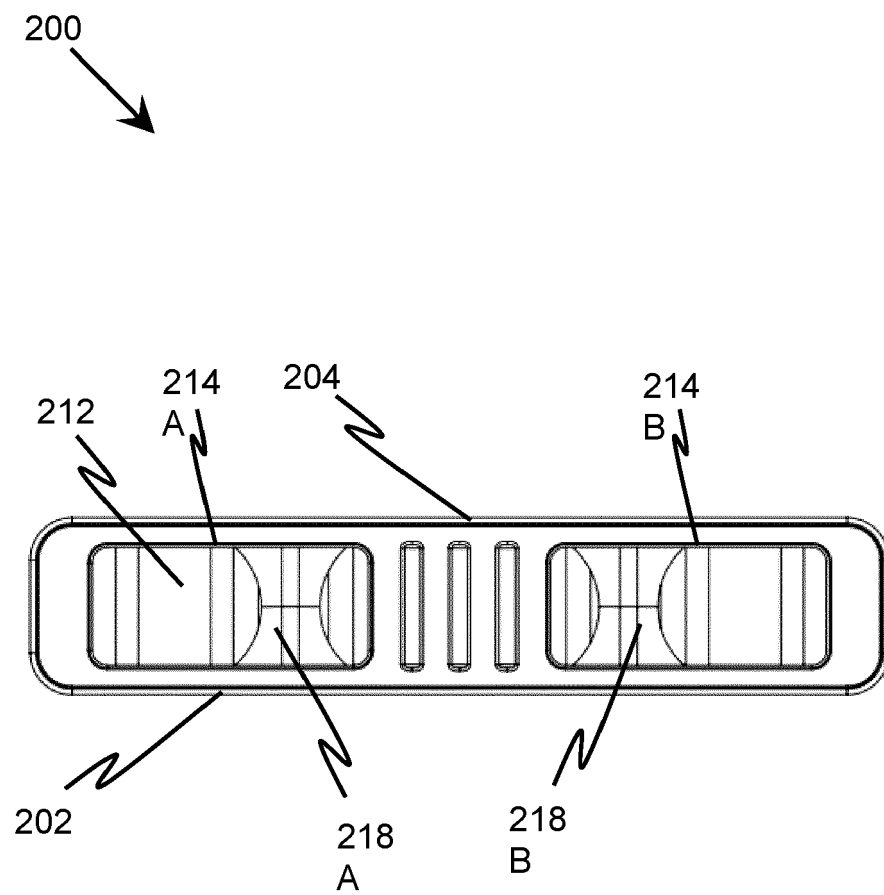


FIG. 2C

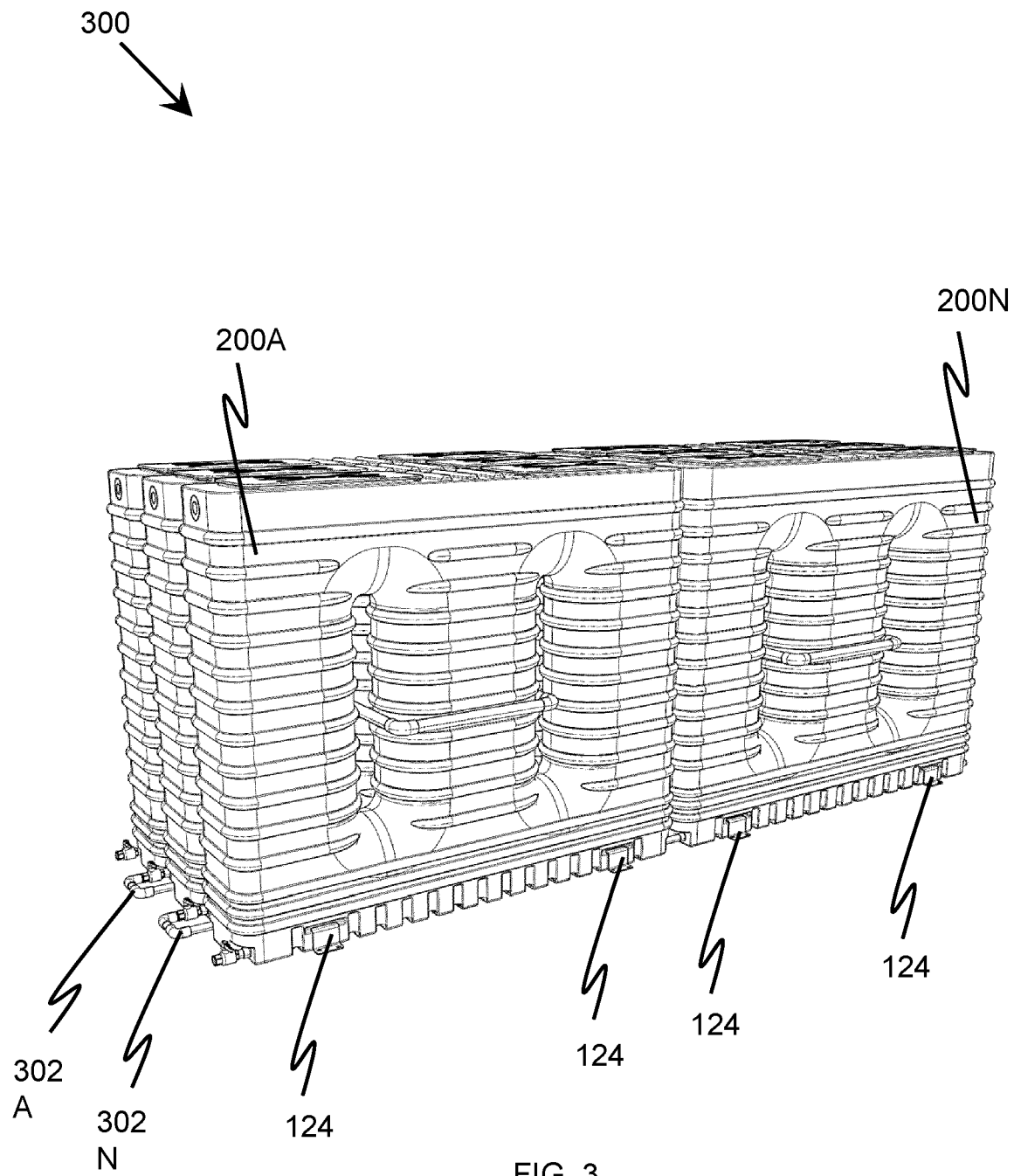


FIG. 3

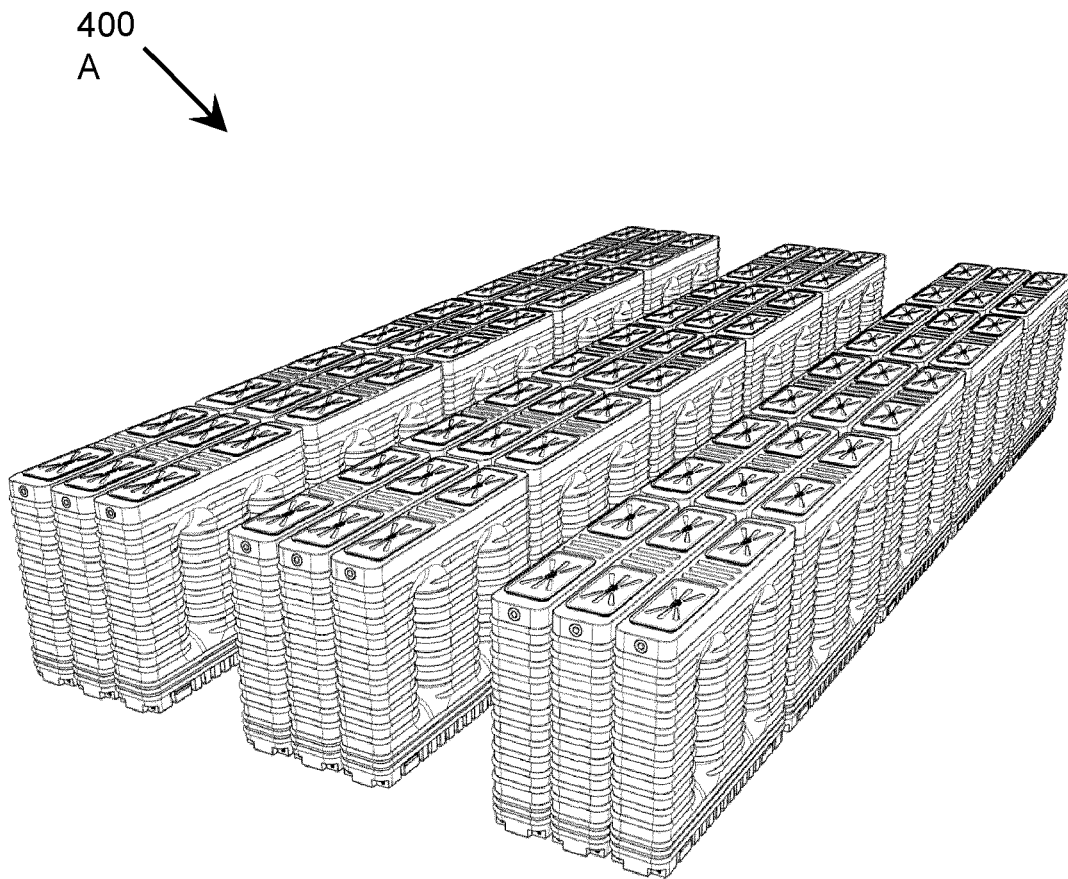


FIG. 4A

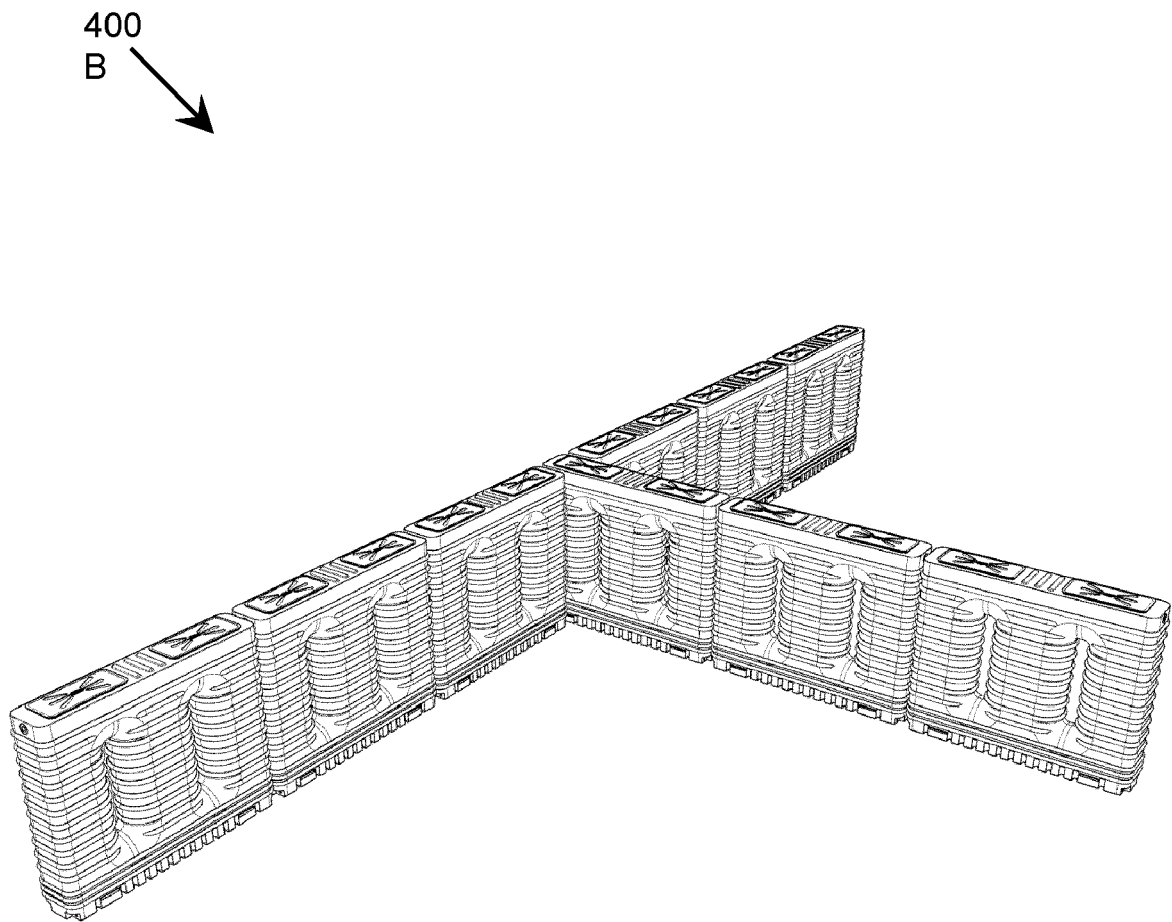


FIG. 4B

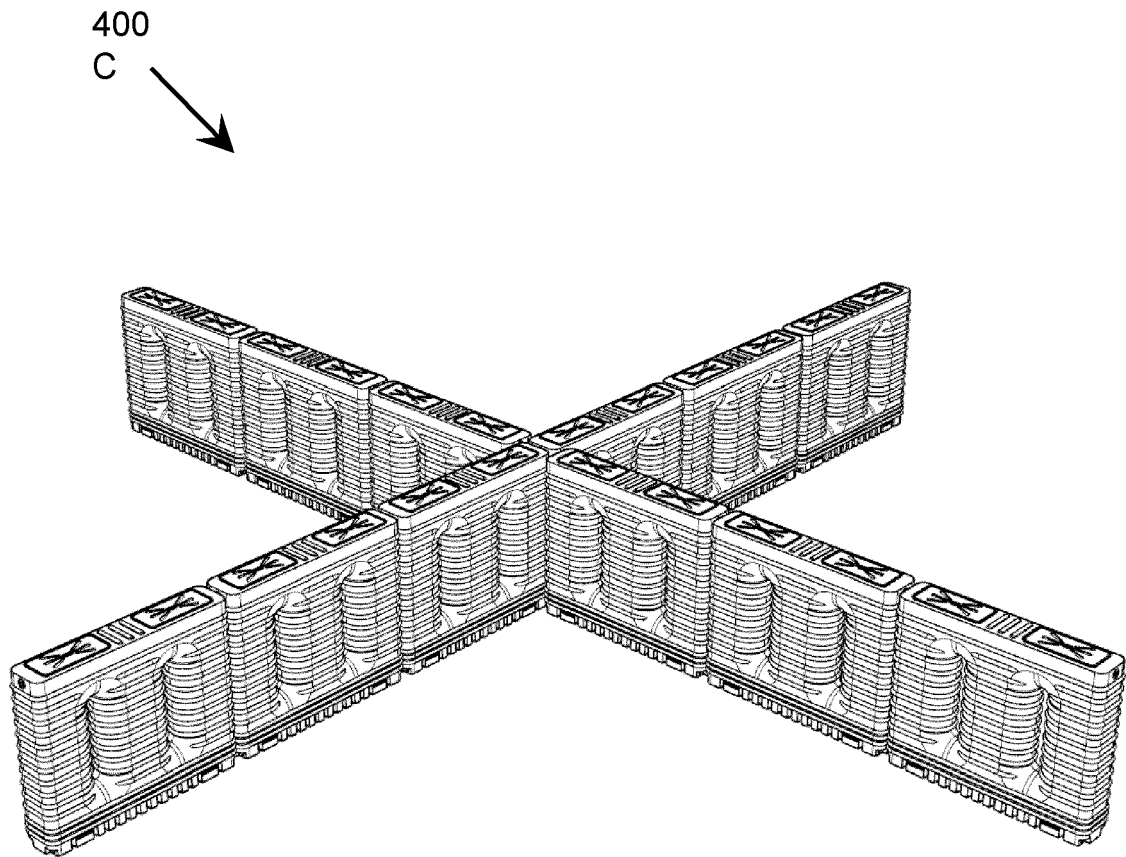


FIG. 4C

400
D

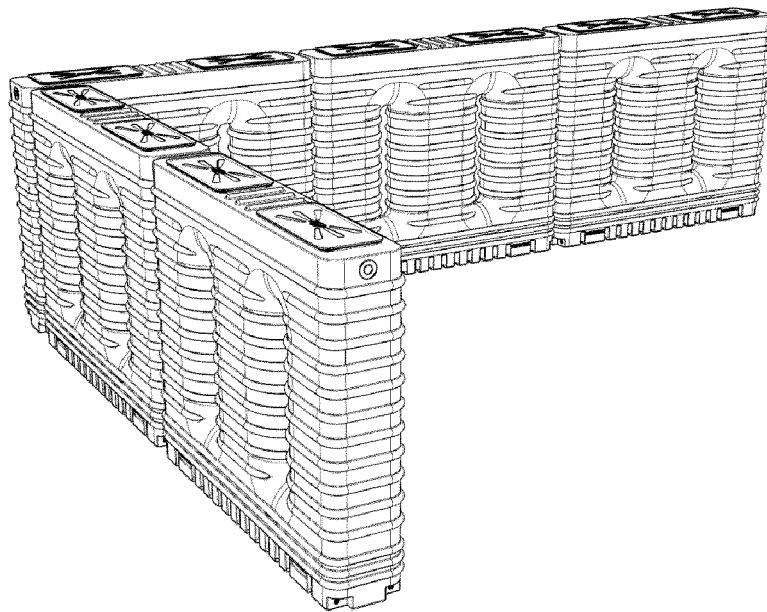


FIG. 4D

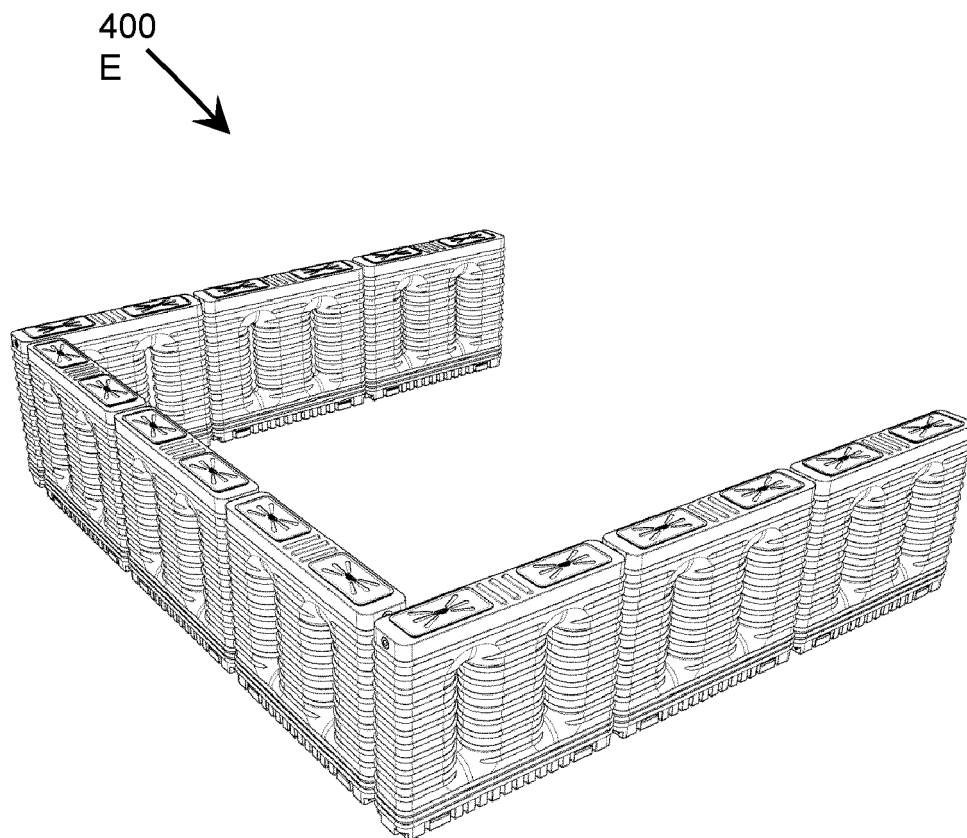


FIG. 4E

400
F

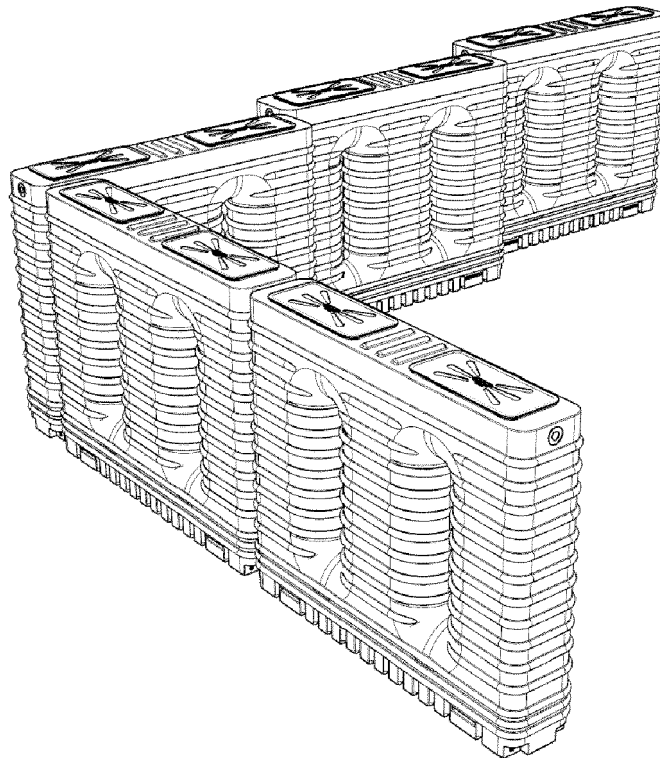


FIG. 4F

400
G

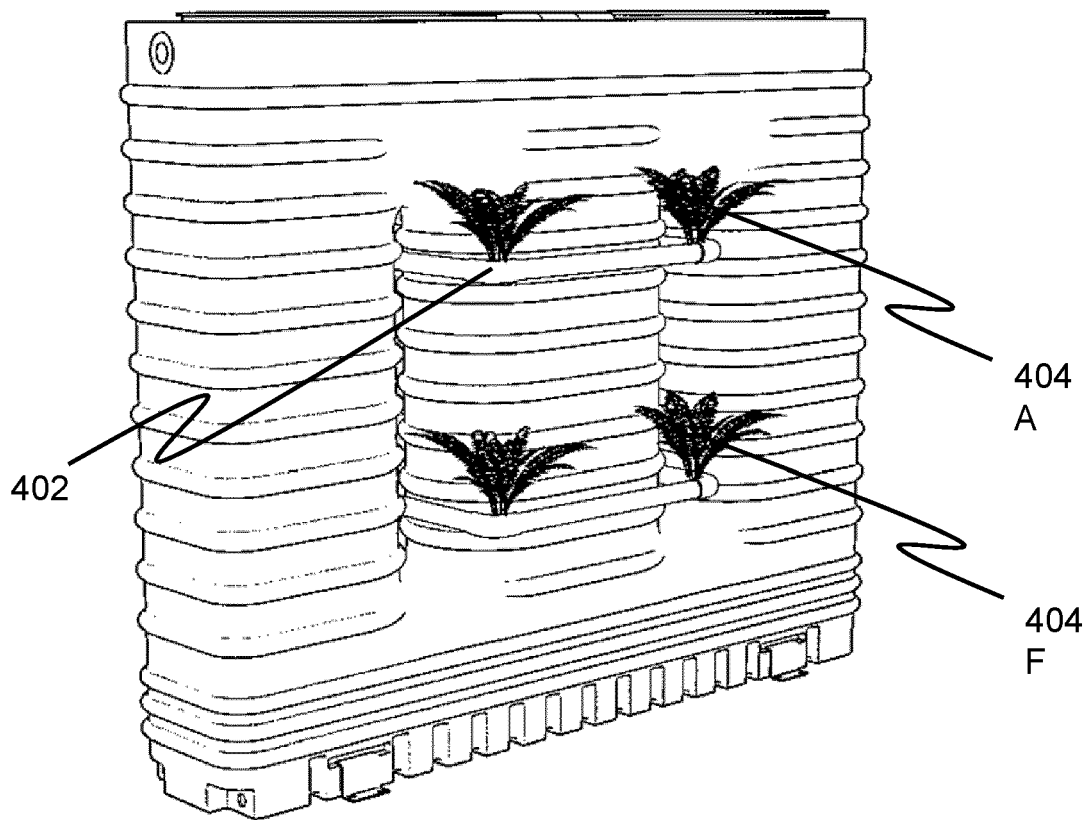


FIG. 4G



EUROPEAN SEARCH REPORT

Application Number

EP 22 20 8098

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2015/217899 A1 (GINN JEFFREY STEVEN [US]) 6 August 2015 (2015-08-06) * page 1, paragraph 8 * * page 2, paragraph 24 - page 3, paragraph 46; figures *	1, 2, 5-11, 15-18	INV. B65D21/08 B65D88/02 B65D88/76 B65D21/02
X	DE 20 2007 005707 U1 (GRAF PLASTICS GMBH [DE]) 28 June 2007 (2007-06-28) * page 3, paragraph 17 - page 4, paragraph 19 * * page 4, paragraph 24 - page 5, paragraph 38; figures *	1, 5-10, 15-18	
X	EP 2 116 485 A1 (GRAF PLASTICS GMBH [DE]) 11 November 2009 (2009-11-11) * page 2, paragraph 5 - page 4, paragraph 24 * * page 4, paragraph 26 - page 5, paragraph 33; figures *	1, 2, 5, 6, 8-11, 15, 16, 18 7, 17	
A	WO 2005/056936 A1 (MANUEL MELLISA JOY [AU]; CORDELL STEPHEN [AU]) 23 June 2005 (2005-06-23) * page 4, line 3 - page 8, line 15; figures *	1, 3-5, 8-10, 13-15, 18 6, 7, 16, 17	TECHNICAL FIELDS SEARCHED (IPC) B65D E03B E03F
A	AU 2008 255 231 A1 (THIN TANKS PTY LTD) 1 April 2010 (2010-04-01) * the whole document *	1-18	
The present search report has been drawn up for all claims			

1

EPO FORM 1503 03:82 (P04C01)

Place of search Munich	Date of completion of the search 15 March 2023	Examiner Fajárnés Jessen, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document		

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 22 20 8098

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

15-03-2023

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2015217899 A1	06-08-2015	US D766397 S US 2015217899 A1	13-09-2016 06-08-2015
DE 202007005707 U1	28-06-2007	AU 2008201724 A1 DE 202007005707 U1 FR 2917725 A1	06-11-2008 28-06-2007 26-12-2008
EP 2116485 A1	11-11-2009	AT 491658 T EP 2116485 A1 PL 2116485 T3 SI 2116485 T1	15-01-2011 11-11-2009 31-05-2011 31-03-2011
WO 2005056936 A1	23-06-2005	NONE	
AU 2008255231 A1	01-04-2010	NONE	