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Daniluk et al.(10) **Pub. No.: US 2021/0363716 A1**(43) **Pub. Date: Nov. 25, 2021**(54) **MULTIPURPOSE STACKABLE
SELF-FILLING INTERLOCKING
WATERTIGHT MODULAR BARRIER
SYSTEM***E01F 13/02* (2006.01)*E02B 3/10* (2006.01)*F41H 5/24* (2006.01)(52) **U.S. Cl.**CPC *E01F 15/088* (2013.01); *E04B 1/02*
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Stephen Daniluk, Aurora, CO (US)(21) Appl. No.: **16/625,760**(22) PCT Filed: **Dec. 22, 2019**(86) PCT No.: **PCT/US19/68210**

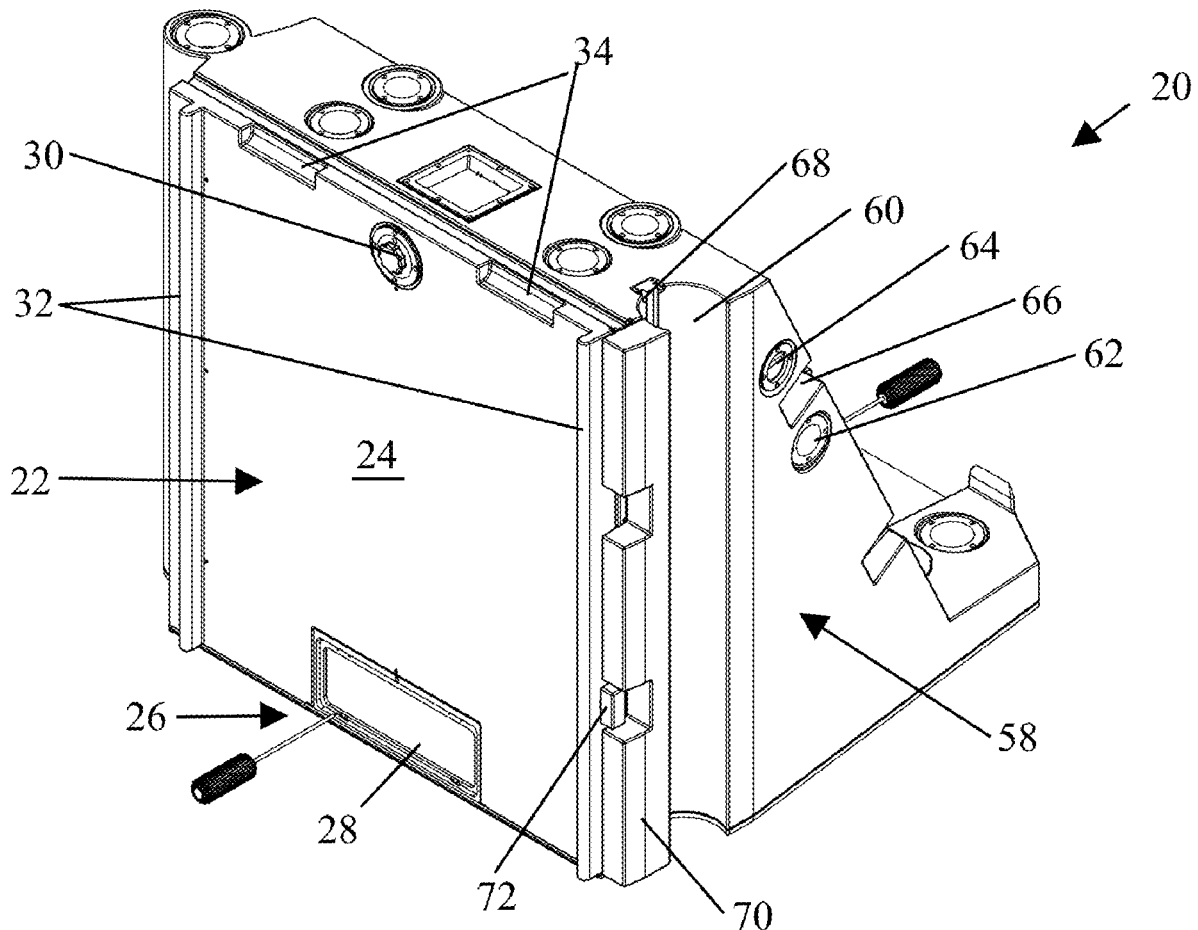
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22, 2018.**Publication Classification**(51) **Int. Cl.***E01F 15/08* (2006.01)*E04B 1/02* (2006.01)

(57)

ABSTRACT

Modular multipurpose, rapidly deployable, barriers that couple together into barrier walls and barrier blocks. The barrier walls are watertight, self-filling, and capable of being coupled horizontally without vertically lifting the barriers. The barriers are capable of being vertically and horizontally stacked in all directions while also allowing the stacked blocks to be offset and reinforced with poles, ropes and cables that thread through the stack vertically to support fencing and other materials. Horizontally, the barriers also permit poles, ropes and cables to be thread through the barriers greatly increasing their strength. The modular barriers are also stackable to be efficiently stored within truck and shipping container. The barriers may also be bullet proof.



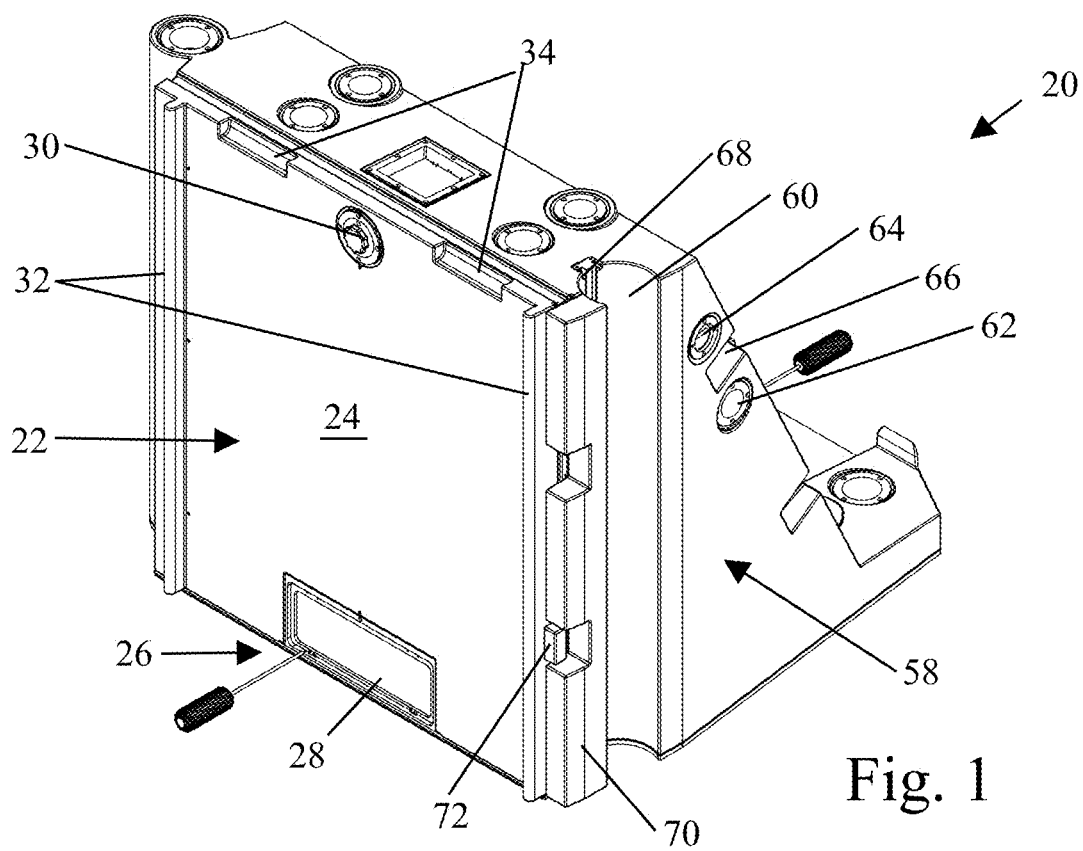


Fig. 1

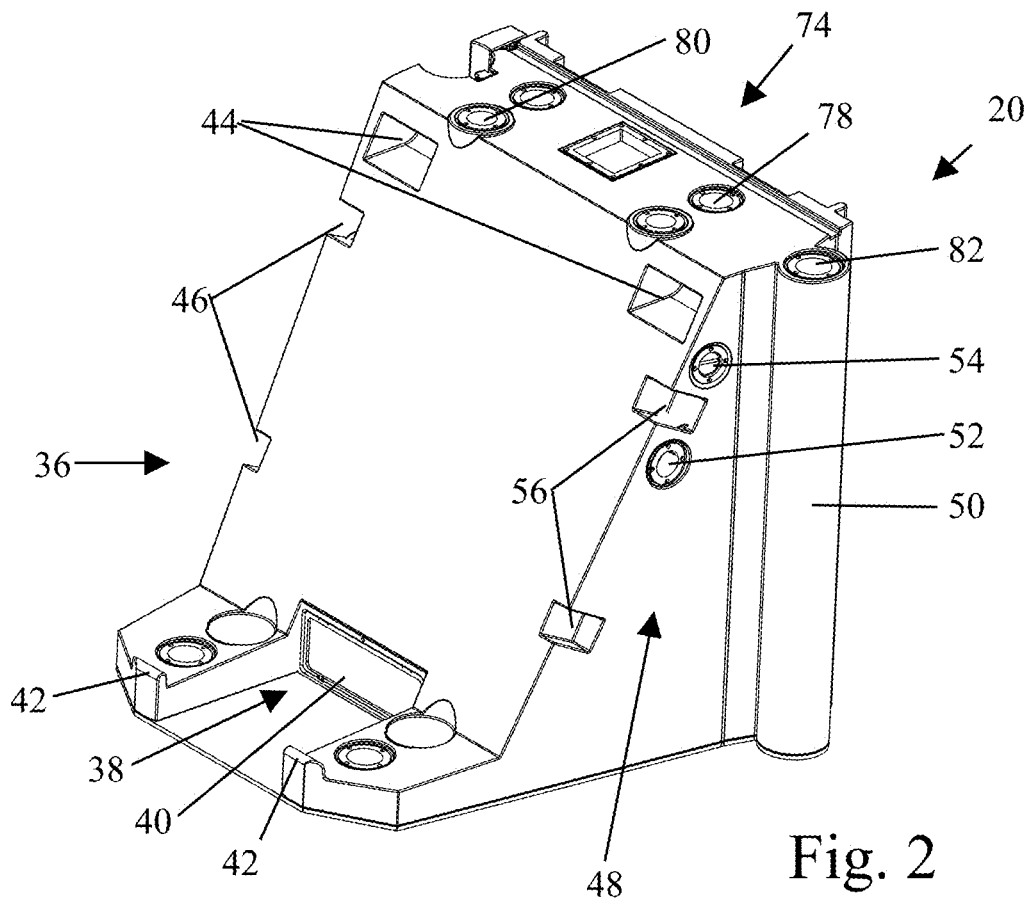
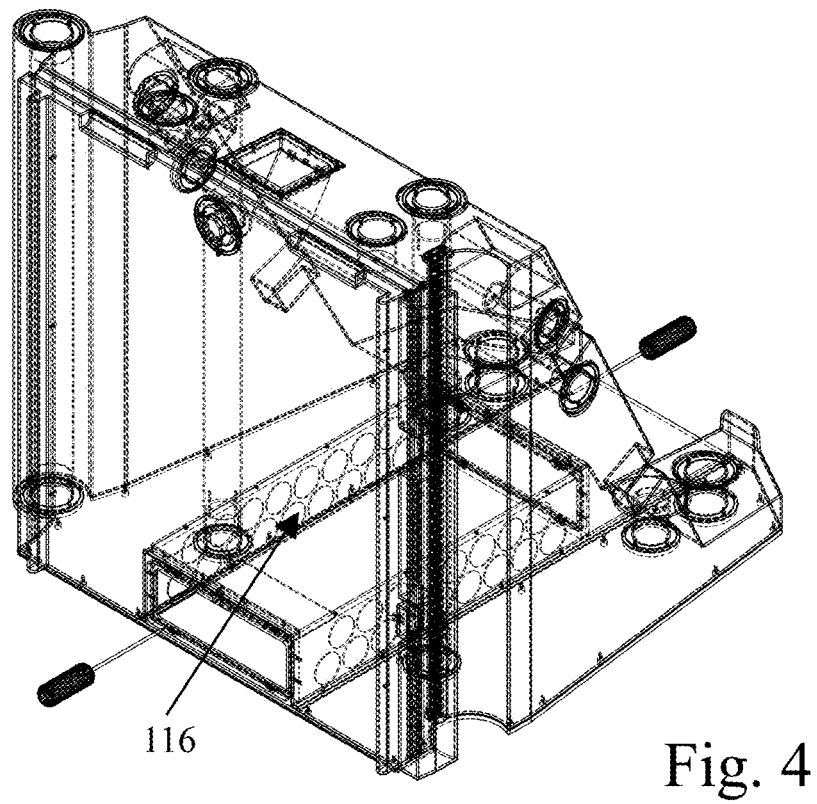
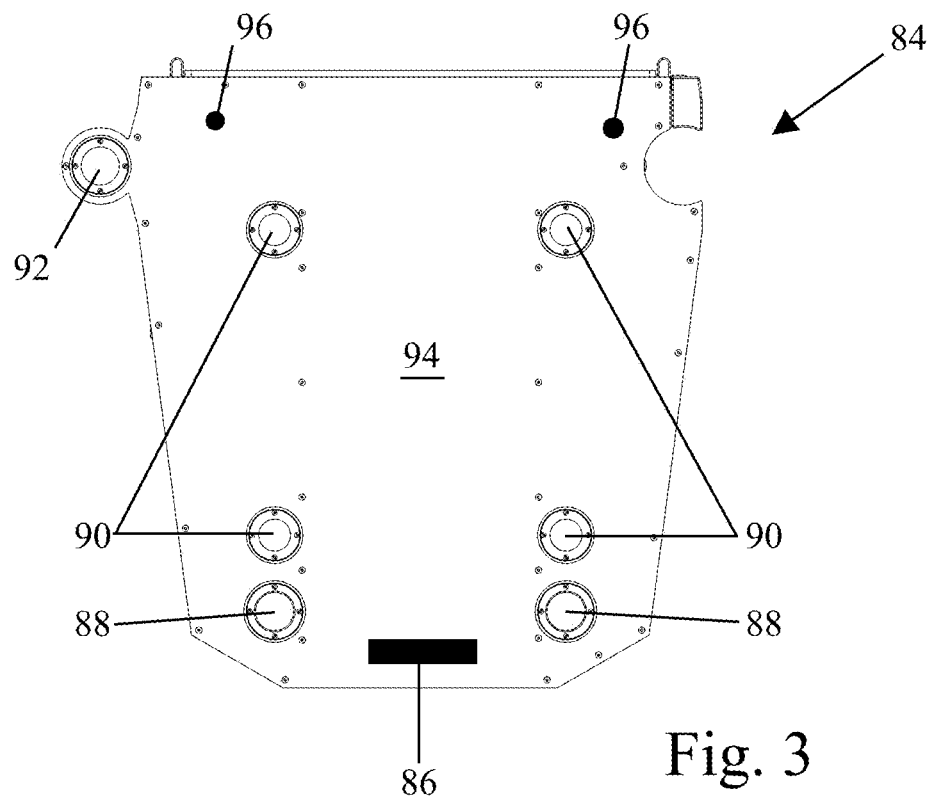


Fig. 2



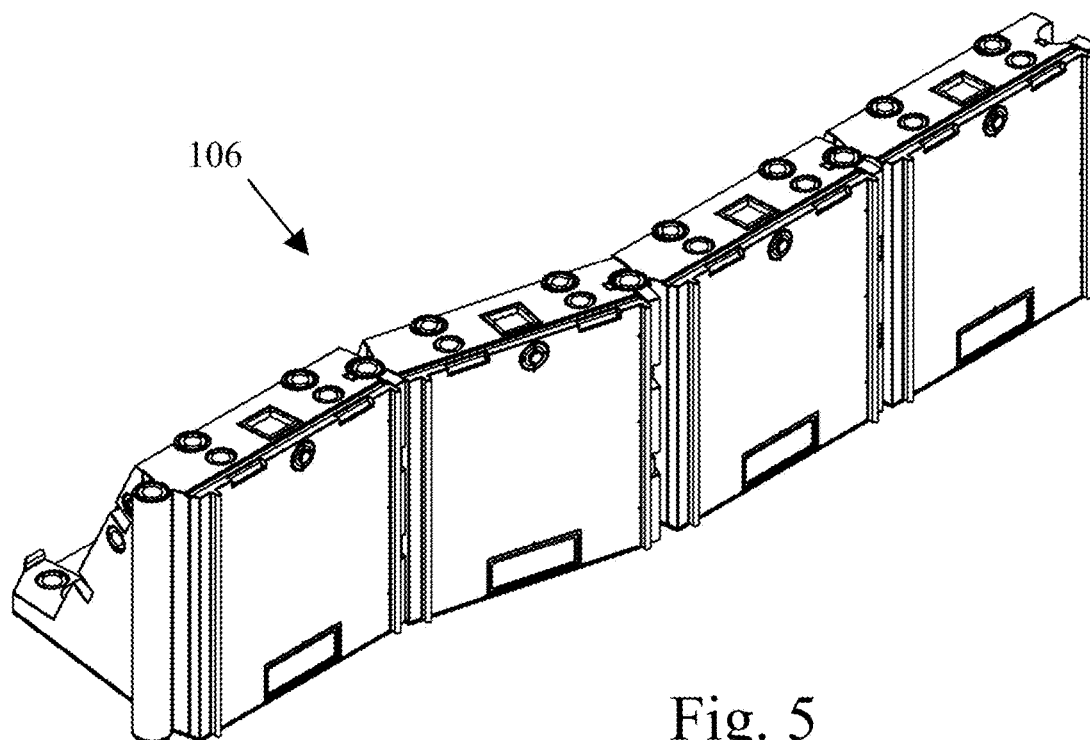


Fig. 5

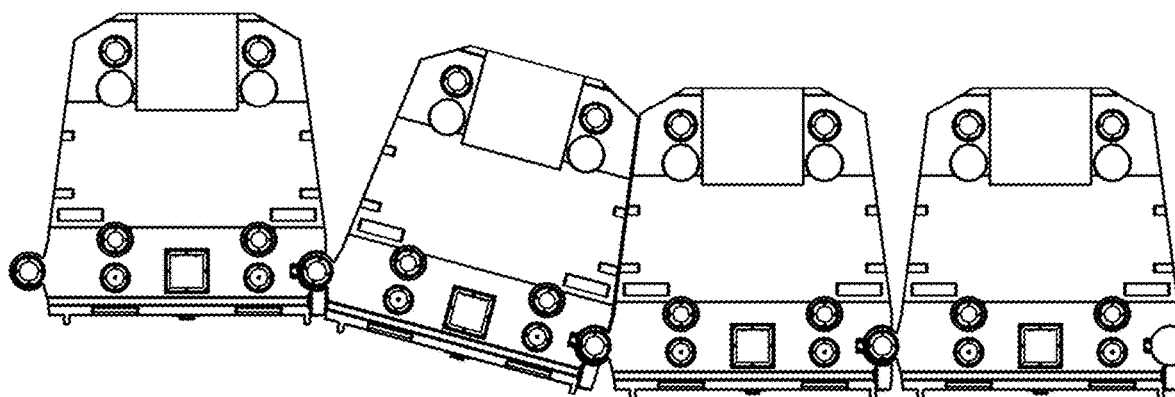


Fig. 6

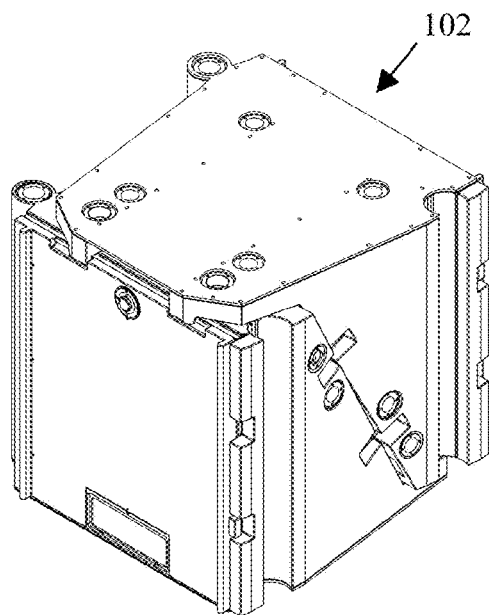


Fig. 7

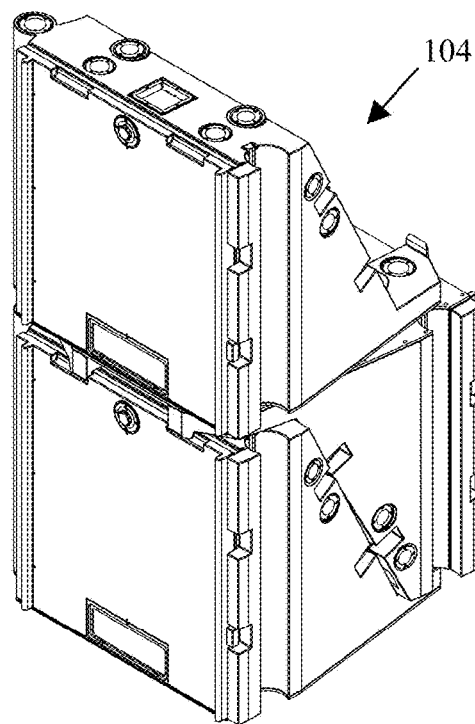


Fig. 8

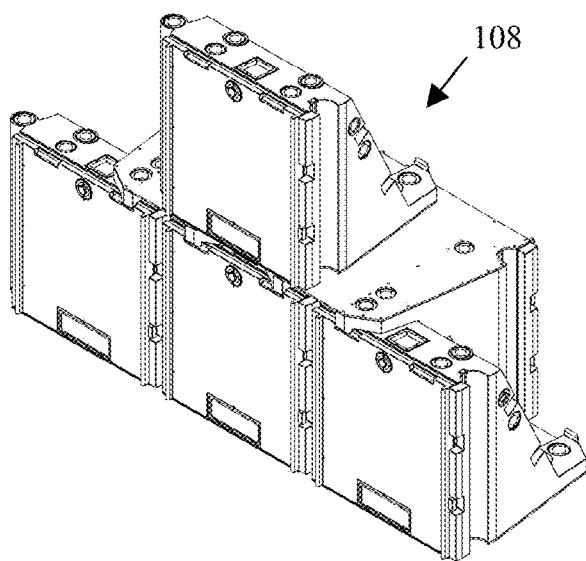


Fig. 9

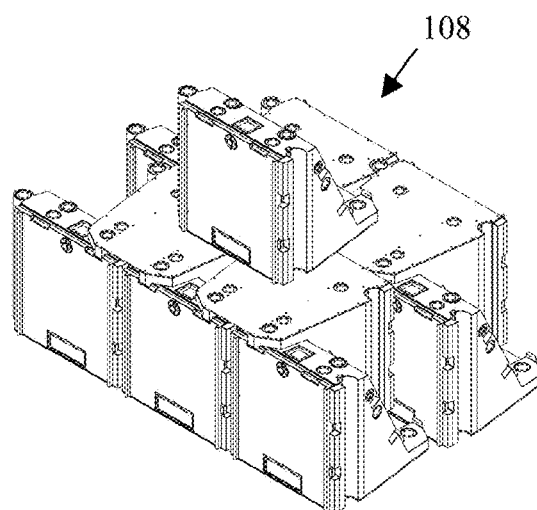


Fig. 10

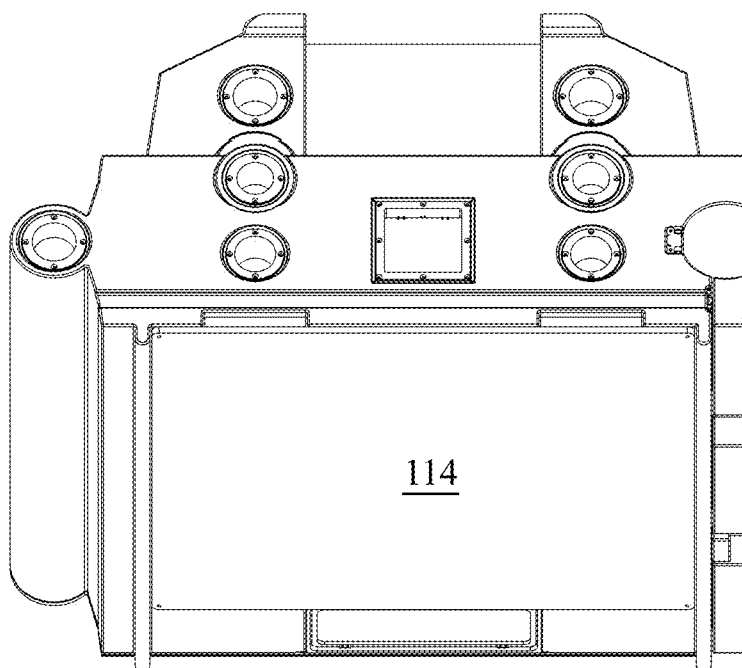


Fig. 11

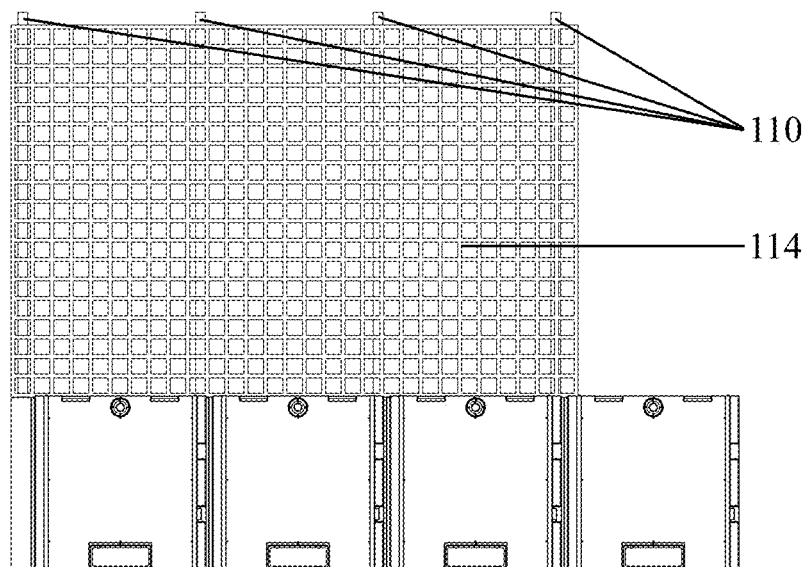


Fig. 12

MULTIPURPOSE STACKABLE SELF-FILLING INTERLOCKING WATERTIGHT MODULAR BARRIER SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention is in the technical field of portable modular barriers commonly used for, among other things: flood prevention, crowd control, containment pools, traffic control, and security barricades. More particularly, the present invention pertains to the field of water filled modular interlocking barriers.

2. Description of Related Art

[0002] Block shaped modular barriers are common in the art. The most common block shaped barriers used for traffic and flood prevention are Jersey Barriers which are made of concrete and have a wide base and narrow top. Jersey Barriers are heavy, difficult to move and are not watertight, but they are good at safely diverting traffic and can be covered with plastic tarps to prevent water from passing through them. Lighter and more easily deployable barriers of a similar shape are often made from roto-molded UV treated high-density polyethylene, these are primarily used in urban or residential areas and are often used to divert automobile and pedestrian traffic. It not uncommon for these to interlock, or to be fillable with water or sand for ballast.

[0003] Currently, the most advanced hollow polyethylene modular barriers are capable of interlocking in a watertight fashion in an end-to-end abutting relationship and self-filling when sufficient ground water is available without laborious preparation of the site.

[0004] US-A-2004/0190993 (Archer-Simms et al) discloses a liquid barrier assembly for the prevention of flow of liquid from one area to an adjacent area. The assembly comprises a plurality of hollow segments each of a plastics material and each defining a substantially rigid chamber. Each segment is formed with a front concave wall against which, in use, liquid was intended to be incident. The front wall of at least one of the segments has a plurality of apertures that allow the passage of liquid into and out of the chamber. Adjacent segments are connected to one another in a side by side relationship by an elongate bilobal or “dog-bone” connector.

[0005] U.S. Pat. No. 8,662,790 (Thomas Phelps) discloses A flood barrier comprises hollow self-filling units placed end-to-end and connected at their ends by downwardly tapered bilobal keys inserted into sockets at the ends of the units, wherein the keys incorporate concrete or other ballast for negative buoyancy.

[0006] In both these designs, a separate bilobal “key” is necessary to lock the modular units together in a watertight fashion. Additionally, neither design is capable of being stacked to accommodate the construction or wider, taller, and heavier flood prevention barriers and easier storage and transportation. Essentially, current block shaped stackable self-filling interlocking watertight modular barriers are only interlocking in a side by side fashion.

SUMMARY

[0007] The scope of the present invention is defined solely by the appended claims and detailed description of a preferred embodiment and is not affected to any degree by the statements within this summary. In addressing many of the problems experienced in the related art, such as those relating to flood prevention, the present disclosure generally involves modular barriers that couple into barrier walls and barrier blocks. The barrier walls are watertight, self-filling, and capable of being coupled horizontally without vertically lifting the barriers. The barriers are capable of being vertically and horizontally stacked in all directions while also allowing the stacked blocks to be offset, unitized, and reinforced with poles, ropes, or cables that thread through the stack vertically, horizontally, or may be used to support fencing. The modular barriers are also stackable to be efficiently stored in within truck and shipping container. The barriers may also be bullet proof.

OBJECTS AND ADVANTAGES

[0008] The present disclosure can provide a number of advantages depending on the particular aspect, embodiment, and/or configuration. None of the particular objects or advantages that follow must be entirely satisfied as they are non-exclusive alternatives and at least one of the following objects is met; accordingly, several objects and advantages of the present invention are:

[0009] (a) to provide a block shaped interlocking modular barrier that can couple with itself to form a barrier wall that is watertight;

[0010] (b) to provide a block shaped interlocking modular barrier that can couple with itself to form a barrier cube;

[0011] (c) to provide an interlocking modular barrier that is vertically and horizontally stackable in all directions;

[0012] (d) to provide an interlocking modular barrier that is vertically and horizontally stackable with the proper dimensions for maximum efficiency when stored within a general-purpose intermodal container;

[0013] (e) to provide a modular interlocking barrier that connects to itself without a “key”;

[0014] (f) to provide a modular interlocking barrier that connects to itself with a quick lock;

[0015] (g) to provide a modular interlocking barrier that connects to itself without moving either barrier vertically;

[0016] (h) to provide an interlocking modular barrier that may be manually or self-filling;

[0017] (i) to provide an interlocking modular barrier that incorporates built-in slots for vertical and horizontal poles, ropes or cables;

[0018] (j) to provide an interlocking modular barrier that allows for fencing, sound absorbing blankets and/or other materials to be attached vertically above the barrier;

[0019] (k) to provide an interlocking modular barrier that is vertically and horizontally stackable in all directions that is reinforceable with metal pole, ropes or cables;

[0020] (l) to provide an interlocking modular barrier that is vertically and horizontally stackable on a grade;

- [0021] (m) to provide an interlocking modular barrier that may be secured to the ground with stakes through openings in the bottom of the barrier;
- [0022] (n) to provide an interlocking modular barrier that may comprise an angle on the male and female coupling sides that allows for curvature of a barrier wall;
- [0023] (o) to provide an interlocking modular barrier that may have a graphics panel;
- [0024] (p) to provide an interlocking modular barrier that has openings for pegs, useful for storage and vertical operations;
- [0025] (q) to provide a modular interlocking barrier that is vertically and horizontally stackable in all directions that utilizes specialized padding secured to the bottom surface that provides an anti-skid coefficient of resistance and further protects the unit from wear and tear from frequent use;
- [0026] (r) to provide an interlocking modular barrier that incorporates a curved design that permits the barrier to be roto-molded in such a way as to permit different models to be made from the same mold;
- [0027] (s) to provide an interlocking modular barrier that is reinforced for transport by forklift;
- [0028] (t) to provide an interlocking modular barrier that is bullet proof;
- [0029] (u) to provide a container for transportation of fluids.

[0030] These and other objectives and advantages of the instant invention will become apparent from the following description taken in conjunction with the accompanying drawings wherein are set forth, by way of illustration and example, certain embodiments of the instant invention. The drawings are intended to constitute a part of this specification and include exemplary embodiments of the present invention and illustrate various objects and features thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] Various embodiments are described herein with reference to the following Drawings. Certain aspects of the Drawings are depicted in a simplified way for reason of clarity. Not all alternatives and options are shown in the Drawings and, therefore, the Claims are not limited in scope to the content of the Drawings.

1. FIGURES

- [0032] FIG. 1 illustrates a perspective view of a modular barrier, in accordance with an embodiment of the present disclosure.
- [0033] FIG. 2 illustrates a perspective view of a modular barrier, in accordance with an embodiment of the present disclosure.
- [0034] FIG. 3 illustrates a bottom view of a modular barrier, in accordance with an embodiment of the present disclosure.
- [0035] FIG. 4 illustrates an internal perspective view of modular barrier, in accordance with an embodiment of the present disclosure.
- [0036] FIG. 5 illustrates a perspective view of a deployed modular barrier system, in accordance with an embodiment of the present disclosure.

[0037] FIG. 6 illustrates a bottom view of a deployed modular barrier system, in accordance with an embodiment of the present disclosure.

[0038] FIG. 7 illustrates a perspective view of a cube stack of modular barriers, in accordance with an embodiment of the present disclosure.

[0039] FIG. 8 illustrates a perspective view of a double height stack of modular barriers, in accordance with an embodiment of the present disclosure.

[0040] FIG. 9 illustrates a perspective view of a double height off-set stack of modular barriers, in accordance with an embodiment of the present disclosure.

[0041] FIG. 10 illustrates a perspective view of a double height and double width off-set stack of modular barriers, in accordance with an embodiment of the present disclosure.

[0042] FIG. 11 illustrates a top perspective view of a modular barrier with a bullet proof vertical side, in accordance with an embodiment of the present disclosure.

[0043] FIG. 12 illustrates a perspective view of a deployed modular barrier system supporting a fence, in accordance with an embodiment of the present disclosure.

[0044] Corresponding reference characters indicate corresponding components throughout the several figures of the Drawings. Elements in the several figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example, the dimensions of some of the elements in the figures may be emphasized relative to other elements for facilitating understanding of the various presently disclosed embodiments. Also, common, but well-understood elements that are useful or necessary in commercially feasible embodiment are often not depicted in order to facilitate a less obstructed view of these various embodiments of the present disclosure.

2. REFERENCES

- [0045] 20 Modular Barrier
- [0046] 22 Vertical Side
- [0047] 24 Vertical Side Graphics Panel
- [0048] 26 Vertical Side Bottom Opening
- [0049] 28 Vertical Side Bottom Opening Closure
- [0050] 30 Vertical Side Top Opening
- [0051] 32 Vertical Slide Rails
- [0052] 34 Vertical Side Female Notches
- [0053] 36 Angled Side
- [0054] 38 Angled Side Bottom Opening
- [0055] 40 Angled Side Bottom Opening Closure
- [0056] 42 Angled Side Vertical Male Notches
- [0057] 44 Angled Side Handles
- [0058] 46 Angled Side Female notches
- [0059] 48 Male Coupling Side
- [0060] 50 Male Side Extended Coupling
- [0061] 52 Male Coupling Side Pole, Rope or Cable Opening
- [0062] 54 Male Coupling Side Opening
- [0063] 56 Male Coupling Side Female Notches
- [0064] 58 Female Coupling Side
- [0065] 60 Female Side Receiving Coupling
- [0066] 62 Female Coupling Side Pole, Rope, or Cable Opening
- [0067] 64 Female Coupling Side Opening
- [0068] 66 Female Coupling Side Female Notches
- [0069] 68 Watertight Seal
- [0070] 70 Quick Lock
- [0071] 72 Quick Lock Lock

- [0072] 74 Top Side
- [0073] 76 Top Side Handle
- [0074] 78 Top Side Opening
- [0075] 80 Top Side Pole, Rope or Cable Opening
- [0076] 82 Top Side Extended Coupling Pole, Rope or Cable Opening
- [0077] 84 Bottom Side
- [0078] 86 Bottom Side Handle
- [0079] 88 Bottom Side Opening
- [0080] 90 Bottom Side Pole, Rope or Cable Opening
- [0081] 92 Bottom Side Extended Coupling Pole, Rope or Cable Opening
- [0082] 94 Bottom Side Watertight Seal
- [0083] 96 Bottom Side Slider
- [0084] 98 Quick Lock
- [0085] 100 Quick Lock Lock
- [0086] 102 Barrier Cube
- [0087] 104 Double Height Stack
- [0088] 106 Barrier Wall
- [0089] 108 Offset Stack
- [0090] 110 Poles
- [0091] 112 Fence
- [0092] 114 Bullet Proof or Resistant Panel
- [0093] 116 Internal Reinforcement

DETAILED DESCRIPTION

[0094] The following description is not to be taken in a limiting sense but is made merely for the purpose of describing the general principles of exemplary embodiments, many additional embodiments of this invention are possible. It is understood that no limitation of the scope of the invention is thereby intended. The scope of the disclosure should be determined with reference to the Claims. Reference throughout this specification to “one embodiment,” “an embodiment,” or similar language means that a particular feature, structure, or characteristic that is described in connection with the embodiment is included in at least one embodiment of the present disclosure. Thus, appearances of the phrases “in one embodiment,” “in an embodiment,” and similar language throughout this specification may, but do not necessarily, all refer to the same embodiment.

[0095] Further, the described features, structures, or characteristics of the present disclosure may be combined in any suitable manner in one or more embodiments. In the Detailed Description, numerous specific details are provided for a thorough understanding of embodiments of the disclosure. One skilled in the relevant art will recognize, however, that the embodiments of the present disclosure can be practiced without one or more of the specific details, or with other methods, components, materials, and so forth. In other instances, well-known structures, materials, or operations are not shown or described in detail to avoid obscuring aspects of the present disclosure. Any alterations and further modifications in the illustrated devices, and such further application of the principles of the invention as illustrated herein are contemplated as would normally occur to one skilled in the art to which the invention relates.

[0096] Unless otherwise indicated, the drawings are intended to be read (e.g., arrangement of parts, proportion, degree, etc.) together with the specification, and are to be considered a portion of the entire written description of this invention. As used in the following description, the terms “horizontal,” “vertical,” “left,” “right,” “up” and “down”, as well as adjectival and adverbial derivatives thereof (e.g.,

“horizontally,” “rightwardly,” “upwardly”, etc.), simply refer to the orientation of the illustrated structure as the particular drawing figure faces the reader. Similarly, the terms “inwardly” and “outwardly” generally refer to the orientation of a surface relative to its axis of elongation, or axis of rotation, as appropriate. Also, as used herein, terms such as “positioned on” or “supported on” mean positioned or supported on but not necessarily in direct contact with the surface.

[0097] The phrases “at least one,” “one or more,” and “and/or” are open-ended expressions that are both conjunctive and disjunctive in operation. For example, each of the expressions “at least one of A, B and C”, “at least one of A, B, or C”, “one or more of A, B, and C”, “one or more of A, B, or C” and “A, B, and/or C” means A alone, B alone, C alone, A and B together, A and C together, B and C together, or A, B and C together. The terms “a” or “an” entity refers to one or more of that entity. As such, the terms “a” (or “an”), “one or more” and “at least one” can be used interchangeably herein. It is also to be noted that the terms “comprising,” “including,” and “having” can be used interchangeably.

[0098] For the purposes of promoting an understanding of the principles of the present invention, reference will now be made to the embodiments illustrated in the drawings and specific language will be used to describe the same.

[0099] FIGS. 1 through 4 illustrate the same embodiment of a modular barrier 20. The modular barrier may be hollow and is made of any material suitable for its purpose but is preferably made of roto-molded UV treated high-density polyethylene. Generally, the modular barrier has six sides, a bottom side 86 placed on the ground when in use, a top side 76 facing the sky when in use, a vertical side 22 preferably facing pedestrians and away from water (a dry side) when in use, an angled side 36 preferably facing away from pedestrians and toward water (a wet side) when in use, a male coupling side 50 which may be facing right or left of the vertical or angled side, and a female coupling side 60 which may be facing right or left of the vertical or angled side but also on the opposite side of the male coupling side.

[0100] FIG. 1 illustrates a vertical side 22 perspective view of an embodiment of a modular barrier 20. The face of the vertical side 22 of the modular barrier is generally square in shape and angled at a 90 degree angle from the ground allowing for a pleasant uniform look when coupled with identical modular barriers and may comprise one or more of the following elements: a graphics panel 24, a bottom opening 26, a bottom opening closure 28, a top opening 30, slide rails 32, and female notches 34. The graphic panel 24 is essentially a flat space that is capable of displaying graphics which may be advertisements or warnings visible to pedestrians. The graphics displayed on the graphics panel 24 may be detachable coupled to the modular barrier or molded into the barrier during production. The vertical side bottom opening 26 is generally for letting water enter or exit the barrier, letting the barrier self-fill with ballast preventing the barrier from moving when put under stress. The vertical side bottom opening closure 28 may be a panel or hatch that is capable of preventing the flow of matter into or out of the barrier depending on the user's intent. The vertical side bottom opening closure may also be capable of letting water into the barrier then sealing the water in the barrier thereby retaining any ballast the barrier may accumulate. The vertical side top openings may have several uses, including

allowing air to leave the barrier as it fills with ballast and as opening to allow a user to fill the barrier with ballast when the bottom opening is closed. The vertical side rails 32 allows the barrier to slide easily without much friction as well as protect the graphics panel from sustaining any damage during use. The vertical side female notches 34 may be used as a coupling mechanism when joined with the angled side vertical male notches 42 of an identical modular barrier, coupling the two barriers together in a barrier cube 102.

[0101] As seen in FIG. 11, one embodiment of the modular barrier may also comprise a vertical side 22 with an attached bullet proof or resistant panel 114. The bullet proof or resistant panel may be permanently or removable affixed to the vertical side.

[0102] FIG. 2 illustrates an angled side 36 perspective view of an embodiment of a modular barrier 20. The angled side 22 of the modular barrier is generally a trapezoidal shape on its face and angled along the horizontal axis and may comprise one or more of the following elements: a bottom opening 38, a bottom opening closure 40, vertical male notches 42, handles 44, and female notches 46. The angled side bottom opening 38 is generally for letting water enter or exit the barrier, letting the barrier self-fill with ballast preventing the barrier from moving when put under stress. The angled side bottom opening closure 40 may be a panel or hatch that is capable of preventing the flow of matter into or out of the barrier depending on the user's intent. The angled side bottom opening closure may also be capable of letting water into the barrier then sealing the water in the barrier thereby retaining any ballast the barrier may accumulate. The angled side vertical male notches 42 may be used as a coupling mechanism when joined with the vertical side female notches 34 of an identical modular barrier, coupling the two barriers together securely in a barrier cube 102. The angled side female notches 46 pair with the angled side female notches 46 of an identical modular barrier when they are coupled as a barrier cube 102 and may be used as handles. The trapezoidal shape of the face of the angled side allows the modular barrier to have a narrower angled side than vertical side, which in turn allows a barrier wall 106, as illustrated in FIGS. 5 and 6, to be more tightly curved in the direction of the angled side.

[0103] In the present embodiment, the angled side is the preferred side to face oncoming water, not the vertical side, this arrangement allows the vertical side to present graphics while the angled side more efficiently disperses the force of oncoming liquid up the angled face of the angled side of the barrier, pushing down on the barrier, and further holding it in place.

[0104] Still looking at FIG. 2, you can see the male coupling side 48. The male coupling side is designed to couple with the female coupling side 58. The male coupling side is generally triangular in shape and slanted inward from the vertical side to the angled side and may comprise one or more of the following elements: an extended coupling 50, a side pole, rope or cable opening 52, a side opening 54, and female notches 56. The primary feature of the male coupling side is an extended coupling 50, the extended coupling may be of a variety of shapes but generally extends from the bottom to the top along the vertical side and when coupled with a female coupling side receiving coupling 60 make it possible to couple two identical modular barriers together side by side, creating a barrier wall 106, and may addition-

ally create a watertight seal. In this embodiment, the male side extended coupling is a cylinder that extends most of its diameter away from the male side triangular face. The male coupling side pole, rope or cable opening 52 is an opening that extends through the barrier to the female coupling side pole, rope or cable opening 62 providing an easy attachment for poles, ropes and cables to reinforce a barrier wall, or to provide extra width for a traffic barrier wall when fewer barriers are used. The pole, rope or cable openings throughout the barrier may be reinforced. A male coupling side opening 54 may have several uses, including allowing air to leave the barrier as it fills with ballast and as opening to allow a user to fill the barrier with ballast when other openings are unavailable due to stacking or convenience. The male coupling side female notches 56 serve the same purpose as the angled side female notches.

[0105] Looking back at FIG. 1 again, you can see the female coupling side 58. The female coupling side is also designed to couple with the male coupling side 48. The female coupling side is also generally triangular in shape and slanted inward from the vertical side to the angled side and may comprise one or more of the following elements: a receiving coupling 60, a side pole, rope or cable opening 62, a side opening 64, female notches 66. The receiving coupling may be of a variety of shapes but generally extends from the bottom to the top along the vertical side and when coupled with a male coupling side extended coupling 50 make it possible to couple two identical modular barriers together side by side, creating a barrier wall 106, and may additionally create a watertight seal. In this embodiment, the female side receiving coupling is a cylindrical channel interior to the female side triangular face. The female side pole, rope or cable opening 62 is an opening that extends through the barrier to the male coupling side pole, rope or cable opening 52 providing an easy attachment for poles, ropes and cables to reinforce a barrier wall, or to provide extra width for a traffic barrier wall when fewer barriers are used. A female coupling side opening 64 may have several uses, including allowing air to leave the barrier as it fills with ballast and as opening to allow a user to fill the barrier with ballast when other openings are unavailable due to stacking or convenience. The female coupling side female notches 66 serve the same purpose as the angled side female notches.

[0106] Either the male side extended coupling or the female side receiving coupling may have a watertight seal 68 allowing a barrier wall to retain water flow. In the present embodiment the watertight seal is shown on the female receiving coupling.

[0107] The male side extended coupling 50 and the female side receiving coupling 60 may be facilitated in their coupling by a quick lock 70. The quick lock 70 allows the barriers to be coupled horizontally without any lifting. The quick lock may additionally have a quick lock lock 72 to keep the quick lock in a locked position. The quick lock may attach in a variety of ways so long as it operates quickly and securely attaches the male side extended coupling within the female side receiving coupling securely. In the preset embodiment the quick lock is simply a bar that slides down a channel on the female coupling side, holding the male side extended coupling within the female side receiving coupling. In other embodiments the quick lock may be attached to the barrier by a hinge, pressure fit or other attachment. The quick lock may also secure a watertight seal between two

barriers. In the present embodiment the quick lock lock is merely a notch that prevent the quick lock from rising.

[0108] FIGS. 1 and 2 illustrate the top side 74 of an embodiment of a modular barrier 20. The top side 74 of the modular barrier is generally a trapezoidal shape following the width of the angled side along the horizontal axis and the depth of the angled side along the vertical axis and may comprise one or more of the following elements: a top side handle 76, a top side opening 78, a top side pole, rope or cable opening 80, and a top side extended coupling pole, rope or cable opening 82. The top side openings 78 may have several uses, including allowing air to leave the barrier as it fills with ballast and as opening to allow a user to fill the barrier with ballast when the bottom openings are closed. The top side pole, rope or cable opening 80 is an opening that extends through the barrier to the bottom side pole, rope or cable opening 90 providing an easy attachment for poles, ropes and cables to reinforce a barrier wall, or to provide an easy attachment for poles 110 for the support of a fence 112 as seen in FIG. 12. The top side extended coupling pole, rope or cable opening 82 serve the same purpose as the top side pole, rope or cable opening 80, except it also serves as a point for curvature of a supported fence.

[0109] FIG. 3 illustrates the bottom side 84 of an embodiment of a modular barrier 20. The bottom side 84 of the modular barrier is generally a trapezoidal shape following the width of the top side along the horizontal axis and flat along the vertical axis and may comprise one or more of the following elements: a bottom side handle 86, a bottom side opening 88, a bottom side pole, rope or cable opening 90, a bottom side extended coupling pole, rope or cable opening 92, a bottom side watertight seal 94, and a bottom side slider 96. The bottom side openings 88 may have several uses, including allowing air to leave the barrier as it fills with ballast and as opening to allow a user to fill the barrier with ballast when the top openings are closed and the barrier is upside down in a barrier cube 102. The bottom side pole, rope or cable opening 90 is an opening that extends through the barrier to the top side pole, rope or cable opening 80 providing an easy attachment for poles, ropes and cables to reinforce a barrier wall, or to provide an easy attachment for a poles 110 for the support of a fence 112 as seen in FIG. 12. The bottom side extended coupling pole, rope or cable opening 92 serve the same purpose as the bottom side pole, rope or cable opening 90, except it also serves as a point for curvature of a supported fence. The bottom side watertight seal 94 may be permanently or removably affixed to the bottom of the barrier and serves to provide a friction drag coefficient to prevent sliding and water from flowing underneath the barrier for a watertight barrier wall. The bottom side watertight seal may be made of a rubber matting or any material suitable to reduce slippage and extend the use of the barrier. The bottom side slider 96 allows the barrier to slide across the ground without damaging the barrier or its bottom side watertight seal. The bottom side slider 96 may be anything suitable to its purpose, such as integrated metal ball bearings or wheels.

[0110] FIG. 4 illustrates an internal perspective view of modular barrier, in accordance with an embodiment of the present disclosure. This perspective allows you to see optional internal reinforcement 116, which may be steel, plastic, or any material suitable to its purpose. The internal reinforcement gives the barrier more structural integrity

when stacked and allows for easy movement of the barrier with a forklift when it is full of ballast without damaging the barrier.

[0111] FIG. 7 illustrates an embodiment of a barrier cube 102. A barrier cube is a stack of two identical module barriers the top module barrier stacked upside down and front to back on top of the bottom module barrier forming a cube. In this formation, both the male side extended couplings and the female side receiving couplings of both the top and bottom modular barrier can be coupled with another barrier cube for added strength. Stacking pins may also be inserted into the pole, rope or cable openings. The two module barriers are capable of coupling a number of ways, in one embodiment the angled bottom vertical male notches couple with the vertical side female notches preventing the two module barriers from dislodging with each other unless the top barrier module is lifted upwards. The barrier cube formation is advantageous because the cubes can be stacked in plurality as to increase the height and depth of a barrier wall being assembled. The barrier cube size is designed, when in plurality, to conform to the dimensions of standard truck trailer and shipping container, such as a general-purpose intermodal container, to maximize the consumption of their space when in transit and minimize the storage footprint by stacking vertically. Standard truck trailer and shipping containers have standard internal minimum dimensions of approximately 8'6" of width and 9'6" of height. In a preferred embodiment, a barrier cube is approximately 4 feet along each side forming a 4-foot by 4-foot cube, two such cubes stacked and side by side and two such cubes stacked on top can (creating an 8'x8' shipping size) which closely fits the internal dimensions of standard truck trailers and shipping containers.

[0112] FIG. 8 illustrates an embodiment of a double height stack 104. A double height stack is barrier cube with one or more additional modular barrier stacked on top of the barrier cube.

[0113] FIG. 9 illustrates an embodiment of a double height stack barrier wall.

[0114] FIG. 10 illustrates an embodiment of an offset stack 108. The various pole, rope or cable openings on the modular barriers are spaced horizontally such that the second level of barriers stacked upon a barrier cube can be set directly above the modular barrier cube, split half on each of two barrier cubes or split one quarter on each of four barrier cubes. In this offset configuration poles, ropes, or cables can be run both vertically and horizontally through a stack of barrier cubs, thereby greatly reinforcing the strength and durability of the stack. In this configuration, especially when filled with a sand ballast, the offset barrier stack is capable of resisting the impact of a speeding automobiles, bullets, artillery, or even form a large portable damn for flood waters. Modular barrier may be offset between two barriers that are forming a barrier wall, reinforcing the structure at the ground level and allowing the formation of long ridged walls.

[0115] The various pole, rope, or cable openings on the modular barriers make convenient openings for stakes to be driven through the barrier and into the ground to further stabilize the barrier. The various pole, rope, or cable openings also allow for pegs to be inserted into the barrier or barrier cubes. The pegs can further hold the barrier unit

together, or they can allow the barrier to be more easily stacked and stored. The pegs may be magnetized for ease of use.

[0116] During manufacture of the barrier, a center cavity may be built into the bottom of the barrier to assist in the installation of the internal reinforcement. During manufacture of the barrier, a curvature may be produced on the angled side to assist the barrier in being removed from the roto-mold.

[0117] In addition to the modular barrier described, additional end and turning modules barriers are intended to be used with the modular barrier that allow for the barrier to be easily turned, create watertight abutments with structures, and create temporary water catchments. The end and turning modules are also capable of being stacked into barrier cubes of dimensions similar to the described modular barrier cube and interlocking with them.

[0118] Information as herein shown and described in detail is fully capable of attaining the above-described object of the present disclosure, the presently preferred embodiment of the present disclosure; and is, thus, representative of the subject matter; which is broadly contemplated by the present disclosure. The scope of the present disclosure fully encompasses other embodiments which may become obvious to those skilled in the art, and is to be limited, accordingly, by nothing other than the appended claims, wherein any reference to an element being made in the singular is not intended to mean “one and only one” unless explicitly so stated, but rather “one or more.” All structural and functional equivalents to the elements of the above-described preferred embodiment and additional embodiments as regarded by those of ordinary skill in the art are hereby expressly incorporated by reference and are intended to be encompassed by the present claims.

[0119] Moreover, no requirement exists for a system or method to address each and every problem sought to be resolved by the present disclosure, for such to be encompassed by the present claims. Furthermore, no element, component, or method step in the present disclosure is intended to be dedicated to the public regardless of whether the element, component, or method step is explicitly recited in the claims. However, that various changes and modifications in form, material, work-piece, and fabrication material detail may be made, without departing from the spirit and scope of the present disclosure, as set forth in the appended claims, as may be apparent to those of ordinary skill in the art, are also encompassed by the present disclosure.

What is claimed is:

1. A modular barrier, comprising:

- a bottom side;
- a top side;
- a vertical side;
- an angled side;
- a male coupling side;
- a female coupling side;

wherein two or more identical modular barriers can be coupled side by side to form a barrier wall; and wherein two or more identical modular barriers can be coupled to form a barrier cube.

2. The modular barrier of claim 1, wherein when one or more modular barriers may be stacked on top of a barrier cube to form a barrier stack.

3. The modular barrier of claim 1, wherein when one or more modular barriers may be offset between two modular barriers that have formed a wall, thereby making the barrier wall ridged and unable to curve.

4. The modular barrier of claim 1, wherein when a modular barrier is stacked on top of two or four barrier cubes, equally offset between them, and wherein all the vertical pole, rope, or cable openings of the stacked barrier are aligned with all the vertical pole, rope, or cable opening in the barrier cubes below said barrier.

5. The modular barrier of claim 1, wherein said barrier wall is watertight.

6. The modular barrier of claim 1, wherein said male coupling side comprises an extended coupling and said female side comprises a female side receiving coupling.

7. The modular barrier of claim 6, wherein said extended coupling and said female side receiving coupling are both cylinders shaped to fit within each other.

8. The modular barrier of claim 7, further comprising a watertight seal.

9. The modular barrier of claim 1, wherein said barrier is hollow and Tillable.

10. The modular barrier of claim 9, wherein said barrier is capable of filling with running groundwater when it is present and automatically retaining said groundwater as ballast.

11. The modular barrier of claim 1, further comprising a vertical bullet proof panel.

12. The modular barrier of claim 1, further comprising a bottom side watertight seal that is drag resistant.

13. The modular barrier of claim 12, wherein when a barrier is stacked on top of a barrier cube, then stack is watertight.

14. The modular barrier of claim 1, further comprising a quick lock that allows said barrier wall to be coupled together horizontally without lifting said modular barriers vertically.

15. The modular barrier of claim 14, further comprising a quick lock lock.

16. The modular barrier of claim 1, further comprising pole, rope, or cable openings that run horizontally through said modular barrier's male and female coupling sides and vertically through said barrier's top and bottom.

17. The modular barrier of claim 1, wherein said barrier cubes are sized such that a stack of four of said cubes closely fits the height and width dimensions of standard truck trailer or shipping container.

18. The modular barrier of claim 1, further comprising internal reinforcement.

19. The modular barrier of claim 1, further comprising a graphic panel on the vertical side.

20. The modular barrier of claim 1, further comprising slide rails on the vertical side.

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