CONTAINMENT BERM BRACKET

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ABSTRACT

Containment berms and associated support systems and structures. In one example embodiment, a containment berm bracket includes a substantially rigid first member and a substantially rigid second member. The first member defines a first complementary structure. The second member that defines a second complementary structure and a sidewall clamp. The second complementary structure is configured to releasably engage with the first complementary structure in order that the members can be releasably attached to each other.
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CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims priority from U.S. Provisional Patent Application Ser. No. 60/869,063, filed Jan. 8, 2007 and entitled “FLUID CONTAINMENT BERM WITH L-SHAPED SUPPORT MEMBERS,” which is incorporated herein by reference in its entirety.

BACKGROUND

[0002] The consequences from accidental spills of hazardous or costly fluid or other material can be mitigated using containment berm systems. Containment berm systems typically include a non-permeable fabric attached to a supporting structure that maintains the fabric in a shape suitable for containing spilled material.

[0003] Unfortunately, however, typical containment berm systems can be difficult to assemble, difficult to disassemble, difficult to transport, and difficult to repair. Many of these systems also require a relatively extensive amount of time and manpower to deploy, the consequences of which can be severe where a spill begins prior to the deployment of the portable containment berm, resulting in environmental contamination and/or loss of costly material.

[0004] Therefore, there exists a need for a containment berm that can be more easily and less costly assembled, disassembled, transported, repaired, and deployed.

SUMMARY OF SOME EXAMPLE EMBODIMENTS

[0005] In general, example embodiments relate to containment berms and associated support systems and structures.

[0006] In one example embodiment, a containment berm bracket includes a substantially rigid first member and a substantially rigid second member. The first member defines a first complementary structure. The second member defines a second complementary structure and a sidewall clamp. The second complementary structure is configured to releasably engage the first complementary structure in order that the members can be releasably attached to each other.

[0007] In another example embodiment, a containment berm bracket includes a substantially rigid first member and a substantially rigid second member. The first member defines a sidewall clamp. The second member defines a skirt clamp. The second member is attached to the first member with an axis of the second member being generally oriented at an angle between about 40° and about 140° with respect to an axis of the first member.

[0008] In yet another example embodiment, a containment berm bracket includes a fabric reservoir, a fabric skirt, and a plurality of containment berm brackets. The fabric reservoir includes a base and a sidewall attached to the base around a perimeter of the base. The fabric skirt is attached to the base around the perimeter of the base. Each of the containment berm brackets includes a substantially rigid first and a substantially rigid second member. The first member defines a skirt clamp and a first complementary structure. The skirt clamp is releasably secured to the skirt. The second member defines a sidewall clamp and a second complementary structure. The sidewall clamp is releasably secured to the sidewall. The second complementary structure is configured to releasably engage the first complementary structure in order that the members can be releasably attached to each other.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] To further clarify aspects of the example embodiments, a more particular description of these example embodiments will be rendered by reference to the appended drawings. It is appreciated that these drawings depict only example embodiments of the invention and are therefore not to be considered limiting of its scope. The example embodiments will be described and explained with additional specificity and detail through the use of the accompanying drawings in which:

[0010] FIG. 1 is a perspective view of an example containment berm including example containment berm brackets;

[0011] FIG. 2A is a side view of one of the example containment berm brackets of FIG. 1 attached to the example containment berm (in cross-section) of FIG. 1;

[0012] FIG. 2B is a side view of a portion of one of the example containment berm brackets of FIG. 1 attached to the example containment berm (in cross-section) of FIG. 1;

[0013] FIG. 2C is a perspective of one of the example containment berm brackets of FIG. 1;

[0014] FIG. 2D is a perspective view of one of the example containment berm brackets of FIG. 1 attached to the example containment berm of FIG. 1;

[0015] FIG. 3 is a perspective of a second example containment berm bracket;

[0016] FIG. 4 is a side view of a third example containment berm bracket;

[0017] FIG. 5 is a side view of a fourth example containment berm bracket; and

[0018] FIG. 6 is a side view of a fifth example containment berm bracket.

DETAILED DESCRIPTION OF SOME EMBODIMENTS

[0019] Example embodiments relate to containment berm brackets. The example brackets disclosed herein can be assembled into a containment berm in a manner that enables each bracket to be selectively replaced without modification to other components of the containment berm. For example, where the containment berm requires repair due to the breakage of a bracket, the containment berm can be repaired by simply disassembling the bracket from the containment berm and replacing the bracket. Some of the example brackets disclosed herein also allow the containment berm to be folded up and stowed. The example brackets disclosed herein can also enable the relatively simple and rapid deployment of a containment berm. This ability to deploy a containment berm relatively rapidly makes the containment berm relatively effective at containing spills that begin prior to the deployment of the containment berm.

[0020] Reference will now be made to the drawings to describe various aspects of example embodiments of the invention. It is to be understood that the drawings are diagrammatic and schematic representations of such example embodiments, and are not limiting of the present invention, nor are they necessarily drawn to scale.

A. Example Containment Berm

[0021] Reference is first made to FIG. 1 which discloses aspects of an example containment berm. The example
containment berm 100 is suitable for use in a variety of applications and operating environments. For example, the example containment berm 100 may be deployed in remote site environments where there is a possibility of spilled material. The example berm is designed to capture spilled material in order to prevent that material from impacting the surrounding environment and/or to recapture the spilled material.

[0022] For example, in certain situations, governmental agencies require businesses that deal with hazardous materials to take measures to ensure that the materials do not spill and contaminate the environment. To comply with these government requirements, businesses may deploy the example containment berm 100 to protect against spills, for example, from a leaking container.

[0023] One example of an application for some embodiments of the containment berm 100 is deployment in connection with tanker vehicles that need to drive into and out of the containment berm 100. As disclosed elsewhere herein, a portion of a sidewalk of the containment berm 100 may, therefore, be configured to be raised and lowered in order to accommodate the entrance/exit of a tanker vehicle to/from the containment berm 100. The containment berm 100 may further be folded up, after the tanker vehicle has exited the containment berm 100 in order that the containment berm 100, can be stowed and transported on the tanker vehicle as it travels to its next stop. Another application for the containment berm 100 is deployment in connection with temporary or long-term storage of containers, such as barrels, of environmentally hazardous chemicals, as well as flexible containment devices such as fuel bladders. For example, where a new shipment of containers is received, and available permanent containment structures are filled to capacity, one or more containment berms 100 may be deployed and the excess containers may be temporarily stored in the containment berm(s) 100 in order to provide containment from any spills or leaks from the containers.

[0024] As disclosed in FIG. 1, the example containment berm 100 generally includes a reservoir 102, a skirt 104, and several example brackets 200. The reservoir 102 is defined by a base 106 and a sidewalk 108. The sidewalk 108 is attached to the base 106 around a perimeter of the base 106. The reservoir 102 is configured to retain a predetermined volume 110 of spilled material.

[0025] The sidewalk 108 may further include a port 112 through which materials may be drained or siphoned out of the reservoir 102, using a hose for example (not shown). This port 112 may allow the recapture of spilled materials for reuse or disposal.

[0026] The reservoir 102 can be constructed from a variety of different fabrics using a variety of different manufacturing processes. For example, the reservoir 102 may be welded from various sheets of rubberized fabric that is non-permeable and corrosion and chemical resistant. The term “welding” as referred to herein includes, among other processes, hot-air welding, radio frequency welding, or other welding techniques for permanently attaching a portion of one piece of fabric to another piece of fabric, or to another portion of the same piece of fabric. The fabric may further be certified to provide acceptable service under various ranges of temperatures, for example, between about -60°F and about +200°F, or other ranges of temperature depending on the requirements of a particular application. The reservoir 102 may also be constructed to be of sufficient size for receiving and containing various volumes of spilled fluids and/or various sizes of containers or vehicles. For example, the reservoir 102 may be sized to fit a fifty-five gallon drum or may be size to simultaneously fit five eighteen-wheelers (not shown). The thickness of the fabric from which the reservoir 102 is constructed may vary depending on the contemplated application, environmental conditions, and/or other variables. For example, a thickness of thirty thousands of an inch may be sufficient for a fifty-five gallon drum application, but a thicker fabric may be required in an eighteen-wheeler application. As used herein, the term “fabric” refers to any flexible material suitable for use as the reservoir 102 and/or the skirt 104 disclosed herein.

[0027] The skirt 104 is attached to the base 106 around the perimeter of the base 106. In one example embodiment, the skirt 104 may include several grommets 114 that enable the skirt 104 to be staked or otherwise secured to the ground or other surface. The skirt 104 may be constructed from the same fabric as the reservoir 102 or from a different fabric. For example, the skirt 104 may be a substantially solid piece of fabric that is welded to the underside of the base 106. The skirt 104 may further include several slits 116 (see FIGS. 2A, 2B, and 2D) with which a portion of one of the brackets 200 may interface. Additional aspects of the slits 116 will be disclosed in greater detail below in connection with FIGS. 2A-2D.

[0028] The example brackets 200 are removably attached both to the sidewalk 108 of the reservoir 102 as well as to the skirt 104. The brackets 200 may be spaced, for example, between about sixteen inches and about eighteen inches apart around the perimeter of the sidewalk 108, although other spacing distances are possible depending on the particular application of the containment berm 100. Variables that may affect the spacing of the brackets 200 may include, but are not limited to, the size of the containment berm 100, the type of material the containment berm 100 is configured to contain, and/or governmental requirements. Additional aspects of the example brackets 200 will be disclosed below in connection with FIGS. 2A-2D.

B. First Example Bracket

[0029] With reference now to FIGS. 2A-2D, additional aspects of the example bracket 200 will be disclosed. As disclosed in FIG. 2A, the example bracket 200 generally includes a substantially rigid first member 202 and a substantially rigid second member 204. The members 202 and 204 can be of various lengths depending on various factors including, but not limited to, the height of the sidewalk 108, the type of material that the berm 100 is configured to contain, and/or governmental requirements. For example, the members 202 and 204 may be substantially the same length or may be different lengths. The members 202 and 204 can be constructed from a variety of materials using a variety of different manufacturing processes. For example, the members 202 and 204 may be injection molded from a substantially rigid plastic, cast or stamped from a substantially rigid metal, or otherwise formed from any other substantially rigid material such as, but not limited to, wood, rubber, carbon fiber, polyvinyl chloride, or fiber glass. In one example embodiment, the members 202 and 204 may be injection molded from VALOX 357U PBT manufactured by Saudi Basic Industries Corporation (SABIC) Innovative Plastics which is headquartered in Pittsfield, Mass.

[0030] The members 202 and 204 may further be constructed from materials that are corrosion and chemical resistant. The members 202 and 204 may further be constructed...
from materials that are certified to provide acceptable service over various ranges of temperatures, for example, between about −60°C and about +200°C, or other ranges of temperature depending on the requirements of a particular application.

[0031] In addition, the member 202 and/or the member 204 may further include one or more visible indicators that provide information concerning one or more characteristics of the bracket 200 and/or the containment bern 100. The visible indicators can include, for example, color-coded portions, raised or depressed characters, printed characters, or any other visible indicator that can serve to identify characteristics of the bracket 200 and/or the containment bern 100, such as a decal. The term “characters” as defined herein refers to letters, numbers, punctuation, any other symbol, and any combination thereof.

[0032] The characteristics of the bracket 200 and/or the containment bern 100 that can be identified by the visible indicators can include, but are not limited to, the height of the sidewall 108, the type(s) of material that can be contained in the containment bern 100, the temperature range in which the containment bern 100 can be deployed, any other characteristics of the containment bern 100 or any individual components thereof, or any combination of the foregoing. The one or more visible indicators can further and/or alternatively serve other purposes, such as making the bracket 200 more easily visible. For example, a glow-in-the-dark or brightly colored visible indicator can be included as part of the member 202 and/or the member 204.

[0033] As disclosed in FIG. 2A, the first member 202 defines a first contact surface 203 and the second member 204 defines a second contact surface 205. The first contact surface 203 is configured to make contact with the sidewall 108 and the second contact surface 205 is configured to make contact with the ground.

[0034] As disclosed in FIG. 2A, the first member 202 also defines a skirt clamp 206 and the second member 204 defines a sidewall clamp 208. The skirt clamp 206 includes a channel 210 that is open proximate a terminal end 212 of the first member 202. The sidewall clamp 208 includes a channel 214 that is closed proximate a terminal end 216 of the second member 204 and that is open from the terminal end 216. One or both of the channels 210 and 214 may be smooth or wavy or otherwise contoured in order to better grip the fabric of the skirt 104 or the sidewall 108, respectively. Forming the channels 210 and 214 with a wavy or other non-linear shape may further serve to deform the corresponding skirt 104 or the sidewall 108, respectively, on either side of the member to a shape that makes the fabric relatively more rigid than flat fabric.

[0035] Each of the clamps 206 and 208 may define one or more fastening anchors 218 in which a fastener 220 can be removably positioned in order to secure the skirt 104 or the sidewall 108 in the clamp. The fastening anchors 218 may be tapped, unthreaded, or otherwise configured. Example fasteners include, but are not limited to, threaded bolts, self-threading wood screws (such as #10 wood screws that are 1/4 inches long), plastic snaps, or any other fastener capable of implementing the fastener functionality disclosed herein. As disclosed in FIG. 2A, the use of fasteners 220 necessarily entails perforating the skirt 104 or the sidewall 108. However, as long as the fasteners 220 are positioned in the resulting perforations 118, the perforations 118 in the sidewall 108 pose little or no risk of leaking. In addition, the sidewall clamp 208 may create a seal against the sidewall 108 that prevents material in the reservoir 102 from leaking out through the perforations 118 in the sidewall 108.

[0036] Also disclosed in FIG. 2A is a substantially rigid joint 222 cooperatively formed by a first complementary structure 224 defined by the first member 202 and a second complementary structure 226 defined by the second member 204. As disclosed in FIG. 2C, the second complementary structure 226 is configured to releasably engage the first complementary structure 224 in order that the members 202 and 204 can be releasably attached to each other. As disclosed in FIG. 2C, the second complementary structure 226 is also configured to be slidably disengaged from the first complementary structure 224 such that the second member 204 can be manually detached from the first member 202.

[0037] Also disclosed in FIG. 2C is one example configuration for the first and second complementary structures 224 and 226. In the example configuration of FIG. 2C, the first complementary structure 224 is a substantially T-shaped rail and the second complementary structure 226 is a substantially T-shaped groove. The substantially T-shaped rail 224 is configured to slidably engage and disengage the substantially T-shaped groove 226 to allow the second member 204 to be manually attached to, and manually detached from, the first member 202. It is noted that the positions of the substantially T-shaped rail 224 and the substantially T-shaped groove 226 could be reversed, with the substantially T-shaped rail 224 attached to the second member 204 and the substantially T-shaped groove 226 attached to the first member 202. It is also noted that the substantially T-shaped configuration disclosed in FIG. 2C enable the engagement and disengagement of the first and second complementary structures 224 and 226 without requiring the use of any tool(s). Therefore, the engagement and disengagement of the first and second complementary structures 224 and 226 can be accomplished manually using only one or two human hands.

[0038] As disclosed in FIG. 2C, the second complementary structure 226 may further include a mechanical stop 227 that prevents the complementary structure 224 and 226 from becoming inadvertently disengaged from one another. For example, pressure from wind, or gravity, or other forces may cause the second member 204 to slide down and away relative to the first member 202, but the mechanical stop 227 prevents the second member 204 from disengaging from the first member 202. It is noted that this stop may alternatively be included on an opposite side of the first complementary structure 224.

[0039] As disclosed in FIG. 2D, once the first and second complementary structures 224 and 226 are slidably disengaged from one another, the sidewall 108 can be laid flat in the same general plane as the skirt 104 and the base 106 without detaching the first and second members 202 and 204 from the skirt 104 and the sidewall 108, respectively. This capability and configuration can be useful, for example, when folding up and storing the containment bern 100 or when a vehicle, such as a tanker truck, has need to drive into or drive out of the containment bern 100.

[0040] With reference now to FIGS. 2A and 2B, it is noted that the first complementary structure 224 is generally oriented at an angle θ1 of about 45° with respect to an axis 225 of the first member 202. Similarly, the second complementary structure 226 is generally oriented at an angle θ2 of about 45° with respect to an axis 227 of the second member 204. When the second member 204 is releasably attached to the first
member 202, the combination of the angles $\theta_1$ and $\theta_2$ result in the axis 227 of the second member 204 being generally oriented at an angle $\theta_3$ of about 90° with respect to the axis 227 of the first member 202. In other example embodiments, the angles $\theta_1$ and $\theta_2$ may instead be any angle between about 20° and about 70°, resulting in an angle $\theta_3$ between about 40° and about 140°. As used herein, an “axis” of a member is defined as a line that is parallel with a plane defined by at least three non-collinear points where the contact surface of the member would contact a flat surface. For example, the axis 227 of the first member 202 is parallel with a plane defined by at least three non-collinear points where the contact surface 203 of the first member 202 would contact a flat surface. Similarly, the axis 225 of the second member 204 is parallel with a plane defined by at least three non-collinear points where the contact surface 205 of the second member 204 would contact a flat surface.

[0041] The angled orientation of the first and second complementary structures 224 and 226 enables the first and second complementary structures 224 and 226 to bind against each other at the joint 222 as a force F is applied against the sidewall 108 by material contained within the containment berm 100 (see FIG. 1). This binding may help prevent the complementary structures 224 and 226 from becoming inadvertently disengaged from one another.

[0042] It is noted that the first and second complementary structures 224 and 226 are not limited to the example configuration disclosed in FIGS. 2A-2D. Rather, the first and second complementary structures 224 and 226 may instead have any of a variety of different configurations having various levels of releasability. For example, the first and second complementary structures 224 and 226 may be configured as disclosed below in connection with FIGS. 3-6. In other examples, the first and second complementary structures 224 and 226 may be configured using hinges, pins, or other fasteners.

[0043] For example, the first complementary structure 224 may include one half of a hinge and the second complementary structure 226 may include the other half of the hinge. The hinge may be configured to allow the second member 204 to rotate between about 90° and about 180° with respect to the axis 227 of the first member 202. The hinge may alternatively be configured to allow the second member 204 to rotate between about 90° and about 0° with respect to the axis 227 of the first member 202.

[0044] In another example, the first and second complementary structures 224 and 226 may fit together and be held together by one or more pins that are attached to first member 202 and/or the second member 204 using a lanyard. In still another example, the first and second complementary structures 224 and 226 may slide together from an orientation other than that disclosed in FIGS. 2A-2D. For example, the first and second complementary structures 224 and 226 may slide together from one side or the other and may include one or more stops to prevent the first and second complementary structures 224 and 226 inadvertently disengaging from one another. In still another example, the first and second members 202 and 204 may comprise a length of pipe, and the joint 222 may comprise an elbow pipe joint which enables one and/or both lengths of pipe to be releasably connected to the elbow pipe joint. For example, one and/or both lengths of pipe may further include a clamp configured to grip a piece of fabric received in the clamp. In a final example, some combination of the above examples may be employed.

[0045] With continuing reference to FIGS. 2A and 2B, it is noted that when the second member 204 is releasably attached to the first member 202, the second member 204 and the first member 202 collectively define an outside edge 228 that is generally oriented at an angle $\theta_4$ of about 45° with respect to the axis 227 of the first member 202. The edge 228 is also generally oriented at an angle $\theta_5$ of about 45° with respect to the axis 225 of the second member 204. In other example embodiments, the angles $\theta_4$ and $\theta_5$ may instead be any angle between about 20° and about 70°. The edge 228 generally allows for an open space 232 between the bracket 200 and the corner 234 defined by the sidewall 108 and the skirt 104. This open space 232 can provide some slack in the sidewall 108 and the skirt 104 to enable the second member 204 to be slidable disengaged from the first member 202.

[0046] With reference again to FIGS. 2C and 2D, it is noted that each of the members 202 and 204 may define a web/flange shaped cross-section along various portions of the member. This web/flange shaped cross-section enables the members 202 and 204 to be constructed using less material while remaining relatively strongly.

[0047] Several of the example brackets 200 disclosed in FIGS. 2A-2D can, therefore, be assembled into the containment berm 100 in a manner that enables each bracket 200 to be selectively replaced without modification to other components of the containment berm 100. For example, some embodiments of the bracket 200 can be releasably assembled into the containment berm 100 without requiring the containment berm 100 to include special pockets or other welded features in the sidewall 108 and/or the skirt 104 of the containment berm 100. Where the containment berm 100 requires repair, due to the breakage of one of the brackets 200 for example, the containment berm 100 can be repaired by simply removing the broken bracket 200 from the containment berm and assembling a new bracket 200 into the place of the broken bracket 200. As the broken bracket 200 is removably attached to the berm 100, using fasteners 220 for example (see FIG. 2A), the removal of the broken bracket 200 and the attachment of the new bracket 200 are straightforward and can be accomplished without specialized skills and/or specialized equipment. The brackets 200 can thus be releasably attached to the containment berm 100 without requiring the entire berm 100 to be returned to a fabrication facility or scrapped in the event that one of the brackets 200 is broken. The capability to manually slideably attach/detach the first and second members 202 and 204 to/from each other without detaching the first and second members 202 and 204 from the skirt 104 and the sidewall 108, respectively, allows the containment berm 100 to be relatively rapidly deployed, thus making the containment berm 100 relatively effective at containing spills that begin prior to the deployment of the containment berm 100, and relatively rapidly folded up and stowed, thus making the containment berm relatively portable.

C. Second Example Bracket

[0048] With reference now to FIG. 3, a second example bracket 200’ is disclosed. The second example bracket 200’ is similar in form and function to the first example bracket 200 of FIGS. 2A-2D except that the skirt clamp 206’ of the example bracket 200’ includes no fastening anchors and the first and second complementary structures 224’ and 226’ of the example bracket 200’ have an alternate configuration.
The skirt clamp 206 functions similarly to the skirt clamp 206 of FIGS. 2A-2D except that the lack of a fastening anchors on the skirt clamp 206 enables the first member 202 of the bracket 200 to be removed from the skirt 104 (see FIG. 1) without the need to first remove one or more fasteners. Although not configured with a substantially T-shape, the first and second complementary structures 224 and 226 function similarly to the first and second complementary structures 224 and 226 of FIG. 2A-2D in slidably engaging and disengaging one another. Aspects of different embodiments disclosed herein can be combined in various ways to suit differing needs and applications.

D. Third Example Bracket

With reference now to FIG. 4, a third example bracket 200 is disclosed. The third example bracket 200 is similar in form and function to the first example bracket 200 of FIGS. 2A-2D except that the first member 202 and the second member 204 are formed as a single piece. For example, the first member 202 and the second member 204 may be a single injection molded plastic piece. This third example bracket 200 may be useful in berm applications that are moved relatively infrequently, for example. The third example bracket 200 may also be used in combination with other example brackets disclosed herein. For example, with reference again to FIG. 1, an access side 120 of the side wall 108 may employ the first example bracket 200 or the second example bracket 200 while the remaining sides of the side wall 108 may employ the third example bracket 200 in order to allow only the access side 120 to be lowered to allow a vehicle to be driven into the containment berm 100 and raised once the vehicle is appropriately positioned in the containment berm 100. Meanwhile, the remaining sides that employ the third example bracket 200 will remain raised.

E. Fourth Example Bracket

With reference now to FIG. 5, a fourth example bracket 200 is disclosed. The fourth example bracket 200 is similar in form and function to the first example bracket 200 of FIGS. 2A-2D except that the first member 202 and the second member 204 are connected together using a hinge 240. The hinge 240 is configured to allow the first member 202 to swivel until it is alongside the second member 204. The hinge 240 may also be double-hinged to allow the first member 202 to swivel until it is alongside either side of the second member 204. Alternatively, the hinge may instead be configured to allow the first member 202 to swivel until it lays flat opposite the second member 204.

This fourth example bracket 200 may be useful in berm applications that require the berm to be folded without disconnecting the first member 202 from the second member 204. The fourth example bracket 200 may also be used in combination with other example brackets disclosed herein.

F. Fifth Example Bracket

With reference now to FIG. 6, a fifth example bracket 200 is disclosed. The fifth example bracket 200 is similar in form and function to the second example bracket 200 of FIG. 3 except that the first member 202 includes a first flange 250 that defines a first opening 252, and the second member 204 includes a second flange 254 that defines a second opening 256. A spring 258 can be attached to the first and second flanges 250 and 254 through the first and second openings 252 and 256. The spring 258 may be attached before or after the first and second complementary structures 224 and 226 are slidably engaged with each other. The spring 258 may cause the first and second complementary structures 224 and 226 to bind against each other at the joint 222. This binding may help prevent the complementary structures 224 and 226 from becoming inadvertently disengaged from one another. This fifth example bracket 200 may be useful in berm applications that require a reinforced joint 222.

In an alternative embodiment of the fifth example bracket 200, the first member 202 and the second member 204 can be attached to each other using a hinge (not shown) instead of using the complementary structures 224 and 226. For example, a hinge attachment can enable the first member 202 to swivel until it lays flat opposite the second member 204. This alternative embodiment of the fifth example bracket 200 may be configured such that the spring 258 automatically causes the first member 202 and the second member 204 to spring from a flat position into the deployed position. This alternative embodiment of the fifth example bracket 200 may be useful in berm applications that require semi-automated deployment or redeployment of the berm. For example, where the spring 258 automatically causes the first member 202 and the second member 204 to spring into the deployed position, a vehicle driving over the sidewalk of the berm may cause the sidewalk to collapse into a horizontal position (see the horizontal position of the sidewalk 108 in FIG. 2D) by expanding the spring 258 without breaking the bracket 200. After the wheels of the vehicle have passed over the sidewalk, the first member 202 and the second member 204 will automatically spring back into the deployed position, which will cause the sidewalk to return to a vertical position (see the vertical position of the sidewalk 108 in FIG. 1). The fifth example bracket 200 may also be used in combination with other example brackets disclosed herein.

The example embodiments disclosed herein may be embodied in other specific forms. These example embodiments are to be considered in all respects only as illustrative and not restrictive.

What is claimed is:

1. A containment berm bracket comprising:
a substantially rigid first member that defines a first complementary structure; and
a substantially rigid second member that defines a second complementary structure and a sidewalk clamp, the second complementary structure configured to releasably engage the first complementary structure in order that the members can be releasably attached to each other.

2. The containment berm bracket as recited in claim 1, wherein one of the complementary structures comprises a substantially T-shaped rail and the other complementary structure comprises a substantially T-shaped groove, the substantially T-shaped rail being configured to slidably engage and disengage the substantially T-shaped groove to allow the second member and the first member to be manually attached and detached from each other.

3. The containment berm bracket as recited in claim 1, wherein:
the first complementary structure is generally oriented at an angle between about 20° and about 70° with respect to an axis of the first member; and
the second complementary structure is generally oriented at an angle between about 20° and about 70° with respect to an axis of the second member.
4. The containment berm bracket as recited in claim 1, wherein the first member further defines a skirt clamp.
5. The containment berm bracket as recited in claim 4, wherein each fabric clamp defines at least one fastening anchor in which a fastener can be positioned in order to tighten the clamp against a fabric received in the clamp.
6. The containment berm bracket as recited in claim 1, wherein an axis of the second member is configured, when releasably attached to the first member, to be generally oriented at an angle between about 40° and about 140° with respect to an axis of the first member.
7. The containment berm bracket as recited in claim 6, wherein the second member and the first member, when attached to each other, collectively define an outside edge that is generally oriented at an angle of between about 20° and about 70° with respect to an axis of the first member and with respect to an axis of the second member.
8. The containment berm bracket as recited in claim 1, wherein at least one member comprises injection molded plastic.
9. The containment berm bracket as recited in claim 1, wherein a channel of the sidewall clamp is open proximate a terminal end of the first member.
10. The containment berm bracket as recited in claim 1, wherein a channel of the skirt clamp is closed proximate a terminal end of the second member.
11. The containment berm bracket as recited in claim 1, wherein each of the members defines a web/flange shaped cross-section along at least a portion of the member.
12. A containment berm bracket comprising:
a substantially rigid first member that defines a sidewall clamp; and
a substantially rigid second member that defines a skirt clamp, the second member attached to the first member, an axis of the second member being generally oriented at an angle between about 40° and about 140° with respect to an axis of the first member.
13. The containment berm bracket as recited in claim 12, wherein:
the first member further defines a first complementary structure;
the second member further defines a second complementary structure,
wherein the second complementary structure is releasably engaged with the first complementary structure such that the second member is releasably attached to the first member, and wherein the second complementary structure is configured to be slidably disengaged from the first complementary structure such that the second member can be manually detached from the first member.
14. The containment berm bracket as recited in claim 12, wherein the first member and the second member are part of a single injection molded plastic piece.
15. A containment berm comprising:
a fabric reservoir comprising:
a base; and
a sidewall attached to the base around a perimeter of the base;
a fabric skirt attached to the base around the perimeter of the base; and
a plurality of brackets, each comprising:
a substantially rigid first member that defines a skirt clamp and a first complementary structure, the skirt clamp releasably secured to the skirt;
a substantially rigid second member that defines a sidewall clamp and a second complementary structure, the sidewall clamp releasably secured to the sidewall, the second complementary structure configured to releasably engage the first complementary structure in order that the members can be releasably attached to each other.
16. The containment berm as recited in claim 15, wherein one of the complementary structures comprises a substantially T-shaped rail and the other complementary structure comprises a substantially T-shaped groove.
17. The containment berm as recited in claim 16, wherein:
the first complementary structure is generally oriented at an angle between about 20° and about 70° with respect to an axis of the first member;
the second complementary structure is generally oriented at an angle between about 20° and about 70° with respect to an axis of the second member; and
the axis of the second member is configured, when releasably attached to the first member, to be generally oriented at an angle between about 40° and about 140° with respect to the axis of the first member.
18. The containment berm as recited in claim 16, wherein:
the sidewall clamp is releasably secured to the sidewalk without engaging any pocket in the sidewalk; and
the second claim is releasably secured to the skirt without engaging any pocket in the skirt.
19. The containment berm as recited in claim 16, wherein the second member and the first member, when attached to each other, collectively define an outside edge that is generally oriented parallel to a line defined by terminal ends of the members.
20. The containment berm as recited in claim 16, wherein at least one member comprises injection molded plastic.
21. The containment berm as recited in claim 16, wherein the skirt and/or the sidewalk are of pocketless construction.
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