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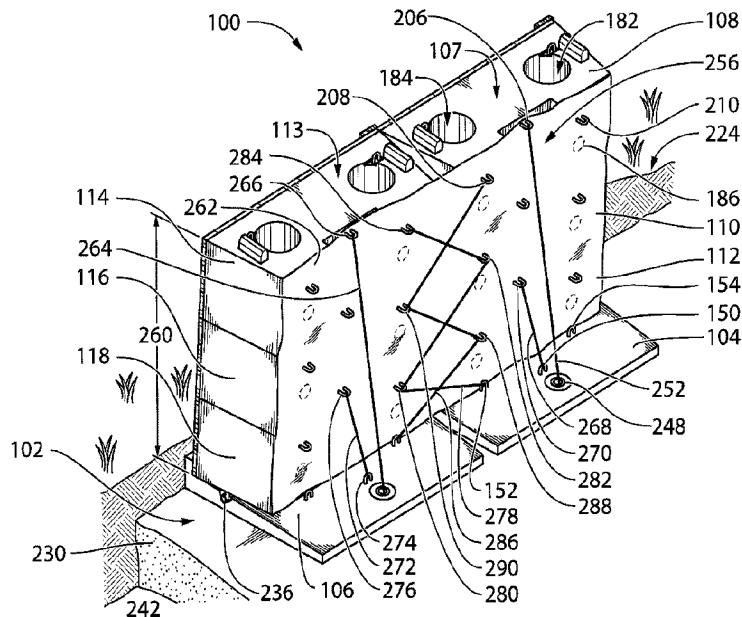
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(54) Titre : SYSTEME DE MUR DE SOUTÈNEMENT, METHODE DE SOUTIEN DUDIT SYSTEME ET TROUSSE DESTINEE A LA CONSTRUCTION DUDIT SYSTEME

(54) Title: RETAINING WALL SYSTEM, METHOD OF SUPPORTING SAME, AND KIT FOR USE IN CONSTRUCTING SAME



(57) Abrégé/Abstract:

There is disclosed a method of supporting a retaining wall including a plurality of wall blocks positioned to retain material against a rear side of the plurality of wall blocks. The method involves attaching at least one of the plurality of wall blocks, on the rear side of the at least one of the plurality of wall blocks, to at least one ground-stabilizing base body supporting the plurality of wall blocks. Kits and systems are also disclosed.

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ABSTRACT

There is disclosed a method of supporting a retaining wall including a plurality of wall blocks positioned to retain material against a rear side of the plurality of wall blocks. The method involves attaching at least one of the plurality of wall blocks, on the rear side of the at least
5 one of the plurality of wall blocks, to at least one ground-stabilizing base body supporting the plurality of wall blocks. Kits and systems are also disclosed.

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**RETAINING WALL SYSTEM, METHOD OF SUPPORTING SAME,
AND KIT FOR USE IN CONSTRUCTING SAME**

FIELD

This disclosure relates generally to retaining walls.

5 RELATED ART

A retaining wall may retain material such as earth against a rear side of the retaining wall, but retaining walls may fail if not adequately supported. Failure of a retaining wall can involve lateral pushout, in which one or more individual blocks, or the entire retaining wall, moves too far forward in response to forces exerted by material against the rear side. Failure
10 of a retaining wall can also involve overturning, in which the retaining wall loses any initial batter and moves too far forward (for example over a vertical axis) in response to forces exerted by material against the rear side. Failure of a retaining wall can also involve global failure, in which material behind and below the retaining wall becomes unstable and the retaining wall moves, along with the material behind and below the retaining wall, into a
15 position that is no longer stable.

Some retaining walls may resist destabilizing forces by building the walls with a batter or by using reinforced earth, for example with geogrid. However, supporting a retaining wall with geogrid or other reinforced earth can require excavating a very large volume of material (such as native earth, for example) from a large backfill region behind where the retaining
20 wall, and then constructing reinforced earth (with geogrid, for example) in the excavated region. Such excavation can be very costly, particularly if utilities, buildings, trees, or other objects complicate the excavation. Further, property lines, steep hills, and legal or other restrictions may complicate or prevent excavation. Still further, the excavated material (native earth, for example) may not be suitable for constructing reinforced earth, so supporting a
25 retaining wall with geogrid or other reinforced earth can require discarding large volumes of excavated material and also acquiring large volumes of a replacement material for constructing the reinforced earth, which can also be very costly.

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SUMMARY

In one embodiment, there is disclosed a method of supporting a retaining wall comprising a plurality of wall blocks positioned to retain material against a rear side of the plurality of wall blocks, the method comprising attaching at least one of the plurality of wall blocks, on the rear side of the at least one of the plurality of wall blocks, to at least one ground-stabilizing base body supporting the plurality of wall blocks.

In some embodiments, attaching the at least one of the plurality of wall blocks to the at least one ground-stabilizing base body comprises applying tension to at least one flexible cable attached to the rear side of the at least one of the plurality of wall blocks and to the at least one ground-stabilizing base body.

In some embodiments, applying tension to the at least one flexible cable comprises applying tension to a flexible cable attached to the rear side of one of the plurality of wall blocks and to a portion of the at least one ground-stabilizing base body extending rearward from the rear side of the at least one of the plurality of wall blocks with the flexible cable extending rearward away from the rear side of the at least one of the plurality of wall blocks.

In some embodiments, applying tension to the at least one flexible cable comprises applying tension to a flexible cable attached to: the rear side of at least one of wall blocks in a first stack of the plurality of wall blocks; the rear side of at least one of wall blocks in a second stack of the plurality of wall blocks adjacent the first stack; and the at least one ground-stabilizing base body supporting the wall blocks in the first and second stacks.

In some embodiments: the at least one of the wall blocks in the first stack and the at least one of the wall blocks in the second stack are in alternating rows of the first and second stacks; and the flexible cable extends diagonally from the rear side of the at least one of the wall blocks in the first stack to the rear side of the at least one of the wall blocks in the second stack.

In some embodiments, applying tension to the flexible cable comprises: sliding the flexible cable against a first attachment surface on the rear side of the at least one wall block in the first stack; and sliding the flexible cable against a second attachment surface on the rear side of the at least one wall block in the second stack.

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In some embodiments, the flexible cable is attached to a pile attached to the portion of the at least one ground-stabilizing base body and engaging material under the at least one ground-stabilizing base body.

5 In some embodiments, the method further comprises attaching at least one pile to the at least one ground-stabilizing base body.

In some embodiments, the method further comprises engaging the at least one pile with material under the at least one ground-stabilizing base body.

10 In some embodiments, engaging the at least one pile with the material under the at least one ground-stabilizing base body comprises positioning concrete in at least one respective space between the at least one pile and the material under the at least one ground-stabilizing base body.

15 In some embodiments, the method further comprises, when the at least one ground-stabilizing base body is already formed and before supporting the plurality of wall blocks on the at least one ground-stabilizing base body, positioning the at least one ground-stabilizing base body into a position on a surface for supporting the plurality of wall blocks.

20 In another embodiment, there is disclosed a kit for use in constructing a retaining wall, the kit comprising: a plurality of wall blocks configured to be positioned into at least one stack with material retained against a rear side of the plurality of wall blocks; and at least one base body positionable on a surface, configured to stabilize ground under the surface, and configured to support the at least one stack of the plurality of wall blocks; wherein the plurality of wall blocks are configured to be attached, on the rear side of the at least one of the plurality of wall blocks, to the at least one base body when the at least one base body supports the plurality of wall blocks.

25 In some embodiments, the kit further comprises at least one pile separate from the at least one base body, attachable to the at least one base body, and configured to engage with material under the at least one base body when the at least one pile is attached to the at least one base body and when the at least one base body supports the plurality of wall blocks.

30 In another embodiment, there is disclosed a retaining wall system comprising: a plurality of wall blocks retaining material on a rear side of the plurality of wall blocks; and at least one ground-stabilizing base body supporting the plurality of wall blocks; wherein at least

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one of the plurality of wall blocks is attached, on the rear side of the at least one of the plurality of wall blocks, to the at least one ground-stabilizing base body.

In some embodiments, the system further comprises at least one flexible cable attaching the rear side of the at least one of the plurality of wall blocks and the at least one
5 ground-stabilizing base body.

In some embodiments: the at least one ground-stabilizing base body comprises a portion extending rearward from the rear side of the at least one of the plurality of wall blocks; the at least one flexible cable comprises a flexible cable attached to rear side of one of the plurality of wall blocks and to the portion of the at least one ground-stabilizing base body
10 extending rearward from the rear side of the at least one of the plurality of wall blocks; and the flexible cable extends rearward away from the rear side of the at least one of the plurality of wall blocks.

In some embodiments: the plurality of wall blocks comprises wall blocks in a first stack and wall blocks in a second stack adjacent the first stack; the at least one ground-
15 stabilizing base body comprises a first ground-stabilizing base body supporting the first stack and a second ground-stabilizing base body supporting the second stack; and the at least one flexible cable comprises a flexible cable attaching the rear side of at least one of the wall blocks in the first stack, the rear side of at least one of the wall blocks in the second stack, and one of the first and second ground-stabilizing base bodies.

In some embodiments: the at least one of the wall blocks in the first stack and the at
20 least one of the wall blocks in the second stack are in alternating rows of the first and second stacks; and the flexible cable extends diagonally from the rear side of the at least one of the wall blocks in the first stack to the rear side of the at least one of the wall blocks in the second stack.

In some embodiments: the flexible cable is slidably attached to the at least one wall
25 block in the first stack at a first attachment surface of the at least one wall block in the first stack; and the flexible cable is slidably attached to the at least one wall block in the second stack at a second attachment surface of the at least one wall block in the second stack.

In some embodiments, the flexible cable is attached to a pile attached to the portion of the at least one ground-stabilizing base body and engaging material under the at least one ground-stabilizing base body.

5 In some embodiments, the system further comprises at least one pile attached to the at least one ground-stabilizing base body and engaging material under the at least one ground-stabilizing base body.

In some embodiments, the system further comprises concrete in a respective space between the at least one pile and the material under the at least one ground-stabilizing base body.

10 In some embodiments, the at least one ground-stabilizing base body supports the plurality of wall blocks independently of any structure in the material retained against the rear side of the plurality of wall blocks.

In some embodiments, the plurality of wall blocks collectively extend at least 12 feet above the at least one ground-stabilizing base body.

15 In some embodiments, the plurality of wall blocks collectively extend at least 15 feet above the at least one ground-stabilizing base body.

In some embodiments, the plurality of wall blocks collectively extend at least 20 feet above the at least one ground-stabilizing base body.

20 In some embodiments: the plurality of wall blocks define at least one drainage channel configured to direct liquid from the rear side of the plurality of wall blocks to the at least one ground-stabilizing base body; and the at least one ground-stabilizing base body defines at least one drainage channel configured to direct liquid, from the at least one drainage channel of the plurality of wall blocks, out of the system.

25 In another embodiment, there is disclosed a method of stabilizing a retaining wall comprising a plurality of wall blocks positioned to retain material against a rear side of the plurality of wall blocks, the method comprising attaching the rear side of a first one of the plurality of wall blocks to the rear side of a second one of the plurality of wall blocks, wherein: the first one of the plurality of wall blocks is in a first row of the plurality of wall blocks; the first one of the plurality of wall blocks is in a first stack of the plurality of wall
30 blocks; the second one of the plurality of wall blocks is in a second row of the plurality of wall

blocks on a vertical side of the first row of the plurality of wall blocks; the second one of the plurality of wall blocks is in a second stack of the plurality of wall blocks on a lateral side of the first stack of the plurality of wall blocks; and attaching the rear side of the first one of the plurality of wall blocks to the rear side of the second one of the plurality of wall blocks

5 comprises applying tension to a first flexible cable attached to the rear side of the first one of the plurality of wall blocks, attached to the rear side of the second one of the plurality of wall blocks, and comprising a portion extending diagonally between the rear side of the first one of the plurality of wall blocks and the rear side of the second one of the plurality of wall blocks.

In another embodiment, there is disclosed a retaining wall system comprising: a
10 plurality of wall blocks retaining material on a rear side of the plurality of wall blocks; and a first flexible cable; wherein the plurality of wall blocks comprises a first one of the plurality of wall blocks and a second one of the plurality of wall blocks; wherein the first one of the plurality of wall blocks is in a first row of the plurality of wall blocks; wherein the first one of the plurality of wall blocks is in a first stack of the plurality of wall blocks; wherein the second
15 one of the plurality of wall blocks is in a second row of the plurality of wall blocks on a vertical side of the first row of the plurality of wall blocks; wherein the second one of the plurality of wall blocks is in a second stack of the plurality of wall blocks on a lateral side of the first stack of the plurality of wall blocks; and wherein the first flexible cable is attached to the rear side of the first one of the plurality of wall blocks, is attached to the rear side of the
20 second one of the plurality of wall blocks, and comprises a portion extending diagonally between the rear side of the first one of the plurality of wall blocks and the rear side of the second one of the plurality of wall blocks.

In another embodiment, there is disclosed a method of stabilizing a retaining wall comprising a plurality of wall blocks positioned to retain material against a rear side of the
25 plurality of wall blocks, the plurality of wall blocks comprising a first stack of the plurality of wall blocks and a second stack of the plurality of wall blocks on a lateral side of the first stack of the plurality of wall blocks, the method comprising attaching at least one of the plurality of wall blocks in the first stack of the plurality of wall blocks, on the rear side of the at least one of the plurality of wall blocks, to at least one ground-stabilizing base body positioned under

and supporting the second stack of the plurality of wall blocks and not positioned under the first stack of the plurality of the plurality of wall blocks.

In another embodiment, there is disclosed a method of stabilizing a retaining wall comprising a plurality of wall blocks positioned to retain material against a rear side of the plurality of wall blocks, the method comprising applying tension to a flexible cable attached to at least one of the plurality of wall blocks, on the rear side of the at least one of the plurality of wall blocks, wherein the flexible cable is attached to a pile attached to a portion of at least one ground-stabilizing base body positioned under and supporting the plurality of the plurality of wall blocks, the portion of the at least one ground-stabilizing base body extending rearward from the rear side of the at least one of the plurality of wall blocks, the pile engaging material under the at least one ground-stabilizing base body.

In another embodiment, there is disclosed a retaining wall system comprising: a plurality of wall blocks retaining material on a rear side of the plurality of wall blocks, the plurality of wall blocks comprising a first stack of the plurality of wall blocks and a second stack of the plurality of wall blocks on a lateral side of the first stack of the plurality of wall blocks; and at least one ground-stabilizing base body positioned under and supporting the second stack of the plurality of the plurality of wall blocks and not positioned under the first stack of the plurality of the plurality of wall blocks; wherein at least one of the plurality of wall blocks in the first stack of the plurality of wall blocks is attached, on the rear side of the at least one of the plurality of wall blocks, to the at least one ground-stabilizing base body.

In another embodiment, there is disclosed a retaining wall system comprising: a plurality of wall blocks retaining material on a rear side of the plurality of wall blocks; at least one ground-stabilizing base body positioned under and supporting the plurality of the plurality of wall blocks, the at least one ground-stabilizing base body comprising a portion extending rearward from the rear side of the at least one of the plurality of wall blocks; a pile attached to the portion of the at least one ground-stabilizing base body and engaging material under the at least one ground-stabilizing base body; and a flexible cable attached to at least one of the plurality of wall blocks, on the rear side of the at least one of the plurality of wall blocks, and attached to the pile.

Other aspects and features will become apparent to those ordinarily skilled in the art upon review of the following description of illustrative embodiments in conjunction with the accompanying figures.

BRIEF DESCRIPTION OF THE DRAWINGS

- 5 FIG. 1 is a top front perspective view of a retaining wall system according to one embodiment.

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FIG. 2 is a top rear perspective view of a base body of the system of FIG. 1.

FIG. 3 is a top front perspective view of a wall block of the system of FIG. 1.

FIG. 4 is a bottom rear perspective view of the wall block of FIG. 3.

FIG. 5 illustrates a base of the system of FIG. 1 during a method according to one
5 embodiment of constructing the system of FIG. 1.

FIG. 6 is a cross-sectional view of the base of FIG. 5 taken along the line VI-VI in
FIG. 5.

FIG. 7 is the cross-sectional view of FIG. 6, further illustrating the method according
to one embodiment of constructing the system of FIG. 1.

10 FIG. 8 is a top rear perspective view of the system of FIG. 1, further illustrating the
method according to one embodiment of constructing the system of FIG. 1.

FIG. 9 is another top rear perspective view of the system of FIG. 1, further illustrating
the method according to one embodiment of constructing the system of FIG. 1.

FIG. 10 is a side elevational view of the system of FIG. 1, constructed according to the
15 method according to one embodiment.

FIG. 11 is a top rear perspective view of a retaining wall system according to another
embodiment.

DETAILED DESCRIPTION

Referring to FIG. 1, a modular-block retaining wall system according to one
20 embodiment is shown generally at **100**. The system **100** includes a base shown generally at
102 and including base bodies **104** and **106**. The system **100** also includes a stack shown
generally at **107** of wall blocks **108**, **110**, and **112** supported by the base body **104**, and a stack
shown generally at **113** of wall blocks **114**, **116**, and **118** adjacent the stack **107** and supported
by the base body **106**.

25 Referring to FIG. 2, the base body **104** is a rebar-reinforced concrete body cast from
concrete (such as standard highway-grade concrete having a compressive strength of about
4,000 pounds per square inch or about 27.6 megapascals, for example) to have the appearance
shown in FIG. 2 and described below. In general, materials and configurations disclosed
herein are only examples of some embodiments, and are not intended to limit or narrow the

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scope of this disclosure. Alternative embodiments may include different materials and configurations.

The base body **104** has a front side shown generally at **120**, a rear side shown generally at **122**, a top side shown generally at **124**, and a bottom side shown generally at **126**. Through-
 5 openings shown generally at **128** and **130** extend between the top side **124** and the bottom side **126** and have diameters of about 10 inches (or about 25 centimeters) to about 12 inches (or about 30 centimeters). In general, dimensions disclosed herein are only examples of some embodiments, and are not intended to limit or narrow the scope of this disclosure. Alternative embodiments may include different dimensions.

10 On the front side **120**, the base body **104** has a width **132** of about 95.25 inches (or about 242 centimeters), and on the rear side **122**, the base body **104** has a width **134** of about 88 inches (or about 223.5 centimeters). Between the front side **120** and the rear side **122**, the base body **104** has a horizontal depth **136** of about 6 feet (or about 183 centimeters). A bottom surface **138** on the bottom side **126** of the base body **104** is generally planar. In this context,
 15 “generally planar” refers to a structure that may not be perfectly planar, but that may function the same as or substantially similar to a planar structure. More generally, “generally” herein includes variations to an aspect, embodiment, or component that may function the same as or substantially similar to such an aspect, embodiment, or component.

Also on the front side **120**, a retaining projection **140** has a thickness **142** of about 4
 20 inches (or about 10 centimeters) and projects to a height **144** of about 14 inches (or about 35.6 centimeters) from the bottom surface **138**. On the top side **124**, the base body **104** has a support surface **146** extending from the retaining projection **140** to the rear side **122**. The support surface **146** is generally planar, except that a generally semi-cylindrical recess shown generally at **148** extends laterally across the base body **104** and has a diameter of about 6
 25 inches (or about 15 centimeters). A center of the generally semi-cylindrical recess **148** is about 21 inches (or about 53.3 centimeters) from a front edge of the base body **104**.

A central attachment loop **150** and lateral attachment loops **152** and **154** are formed from galvanized or stainless steel cables having a diameter of about 0.625 inches (or about 1.6 centimeters) with breaking strengths of about 46,000 pounds (or about 205,000 newtons) or
 30 about 50,000 pounds (or about 222,500 newtons) or more, and are embedded in, and attached

to, the base body **104**. The cables in other embodiments may vary, for example for higher loads that may be required in other embodiments. Further, cables described herein may be aircraft cables or other cables. The central attachment loop **150** is approximately centered laterally on the base body **104** and about 20 inches (or about 51 centimeters) from a rear edge of the base body **104**. The lateral attachment loops **152** and **154** are about 6 feet (or about 183 centimeters) from the front edge of the base body **104** and spaced apart from each other by about 4 feet (or about 122 centimeters).

The base body **104** is tapered so that, adjacent the retaining projection **140**, the base body **104** has a height **156** of about 8 inches (or about 20.3 centimeters), and at the rear edge, the base body **104** has a height **158** of about 4 inches (or about 10 centimeters) in the embodiment shown. As a result, the stack **107** in the embodiment shown in FIG. 1 has a batter of about 3.4 degrees when supported by the base body **104**. The base body **106** is substantially the same as the base body **104**. However, base bodies according to other embodiments may vary, for example with different materials, dimensions, or configurations. For example, in other embodiments, the height **158** is about 5 inches to about 6 inches (or about 12.7 centimeters to about 15.2 centimeters).

Referring to FIGS. 3 and 4, the wall block **108** is cast from concrete (such as standard highway-grade concrete having a compressive strength of about 4,000 pounds per square inch or about 27.6 megapascals, for example) to have the appearance shown in FIGS. 3 and 4 and described below. The wall block **108** has a front side shown generally at **160**, a rear side shown generally at **162**, a top side shown generally at **164**, and a bottom side shown generally at **166**.

On the front side **160**, the wall block **108** has surfaces having images depicting generally horizontal wood boards **168**, **170**, and **172**, an image depicting a generally vertical board **174**, and images depicting bolts **176**, **178**, and **180** fastening the wood board **174** to the wood boards **168**, **170**, and **174** respectively. The images depicting the wood boards **168**, **170**, **172**, **174**, and the images depicting the bolts **176**, **178**, and **180**, may be created using a process similar to the processes illustrated in FIGS. 20-22 of United States patent no. 7,959,380. As described in the description of FIGS. 20-22 of United States patent no. 7,959,380, one or more

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image templates or form liners may be formed (from urethane, for example) to have image-forming surfaces formed from, and complementary to, wood boards defining the images depicting the wood boards **168**, **170**, **172**, and **174** and bolts defining the images depicting the bolts **176**, **178**, and **180**. The image templates or form liners may be placed in a mold, and a colored slurry (for example including iron oxide pigments mixed with water and cement in a volume ratio of about 12.5% iron oxide pigment, about 37.5% water, and about 50% cement) may be mixed very well (for example with a power mixing tool such as a hand mixer) and applied (with a paint brush, for example) on the image-forming surfaces to impart a color (such as a brown wood color, for example) to concrete near the image-forming surfaces.

Concrete in such a mold may be cast to form the wall block **108**.

The wall block **108** defines generally cylindrical drainage channels shown generally at **182** and **184** and extending between the top side **164** and the bottom side **166** of the wall block **108**, each having a diameter of about 18 inches (or about 46 centimeters) or about 21 inches (or about 53 centimeters). A generally cylindrical drainage inlet shown generally at **186** extends between the rear side **162** and the generally cylindrical drainage channel **182**, and a generally cylindrical drainage inlet shown generally at **188** extends between the rear side **162** and the drainage channel **184**. The generally cylindrical drainage inlets **186** and **188** have diameters of about 6 inches (or about 15 centimeters) and are tapered downwards by about 2 degrees to facilitate flow of water from the rear side **162**, through the generally cylindrical drainage inlets **186** and **188**, and into the generally cylindrical drainage channels **182** and **184**.

On the top side, the wall block **108** has a top surface **190** and alignment projections **192** and **194** projecting upward from the top surface **190**. Also on the top side **164**, the wall block **108** includes top attachment loops **196** and **198** formed from galvanized or stainless steel cables having a diameter of about 0.625 inches (or about 1.6 centimeters) with breaking strengths of about 46,000 pounds (or about 205,000 newtons) or about 50,000 pounds (or about 222,500 newtons) or more, and embedded in, and attached to, the wall block **108** for use in lifting and moving the wall block **108**. The cables in other embodiments may vary, for example for higher loads that may be required in other embodiments.

On the bottom side **166**, the wall block **108** has a bottom surface **200** and alignment recesses shown generally at **202** and **204**. The alignment recesses **202** and **204** are

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complementary to the alignment projections **192** and **194** respectively, so that when the bottom surface **200** of the wall block **108** is positioned on top of a top surface (corresponding to the top surface **190**) of an adjacent wall block (such as the wall block **110** shown in FIG. 1), then the alignment recesses **202** and **204** receive the alignment projections (corresponding to the alignment projections **192** and **194** respectively) of the adjacent wall block to align the wall block **108** to the adjacent wall block. The wall block **108** is thus stackable into a stack, such as the stack **107** shown in FIG. 1. Further, the alignment projections **192** and **194** and the alignment recesses **202** and **204** facilitate coupling wall blocks such as the wall block **108** in a stack, so that the wall blocks in the stack have a tendency to remain in the stack, and so that attaching one or more of the wall blocks in the stack to a base body (as described below) may hold the entire stack in place.

When wall blocks such as the wall block **108** are stacked into a stack, the generally cylindrical drainage channels (such as the generally cylindrical drainage channels **182** and **184**) of the wall blocks in the stack are adjacent corresponding generally cylindrical drainage channels of the adjacent wall blocks in the stack such that the generally cylindrical drainage channels form continuous drainage channels in the stack and throughout the entire height of the stack.

On the rear side **162**, the wall block **108** includes a central rear attachment loop **206** and lateral rear attachment loops **208** and **210** formed from galvanized or stainless steel cables having a diameter of about 0.625 inches (or about 1.6 centimeters) with breaking strengths of about 46,000 pounds (or about 205,000 newtons) or about 50,000 pounds (or about 222,500 newtons) or more, and embedded in, and attached to, the wall block **108**. The cables in other embodiments may vary, for example for higher loads that may be required in other embodiments. The central rear attachment loop **206** is centered laterally on the rear side **162** of the wall block **108**, and the lateral rear attachment loops **208** and **210** are on opposite lateral sides of the rear side **162** of the wall block **108**.

Overall, the wall block **108** has a height **212** between the top surface **190** and the bottom surface **200** of about 35.375 inches (or about 89.9 centimeters) and a horizontal depth **214** between the front surfaces of the images depicting the generally horizontal wood boards **168**, **170**, and **172** and the rear side **162** also of about 35.375 inches (or about 89.9

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centimeters). An additional portion on the front side **160**, and having the image depicting the generally vertical wood board **174** and the images depicting the bolts **176**, **178**, and **180**, has a further horizontal depth **216** of about 2 inches (or about 5 centimeters). On the front side **160**, the wall block **108** has a width **218** of about 96.25 inches (or about 244.5 centimeters),
 5 including a horizontal overhang **220** of about 1 inch (or about 2.5 centimeters). On the rear side **162**, the wall block **108** has a width **222** of about 83.25 inches (or about 211.5 centimeters). The wall blocks **110**, **112**, **114**, **116**, and **118** are substantially the same as the wall block **108**. However, wall blocks according to other embodiments may vary, for example with different materials, dimensions, or configurations.

10 FIGS. 1 and 5-10 illustrate a method of constructing the system **100**. Referring to FIG. 5, the method involves excavating a trench shown generally at **224** and having a horizontal width **226** of about 10 feet (or about 3 meters) and a vertical depth **228** of about 20 inches (or about 50 centimeters). The trench may be along a generally straight line, or curved either partially or entirely. Further, the material to be retained by the system **100** may be temporarily
 15 excavated (for example at a slope determined according to the material to be retained by the system **100**) to provide room for construction of the system **100** as described below.

Then, at least a portion of the trench **224** may be filled with sand or gravel **230** (such as “three-quarter-inch minus” or “nineteen-millimeter minus” crushed sand and gravel, or 0.75-inch or 19-millimeter clear crushed gravel, for example) compacted to 100% standard proctor
 20 density (“SPMDD”) and to a thickness **232** of about 6 inches (or about 15 centimeters) and levelled. A height **234** above the compacted sand or gravel **230** is thus about the height **144** (shown in FIG. 2) of the retaining projection **140** over the bottom surface **138** of the base body **104**.

Base bodies (such as the base bodies **104** and **106**) may then be positioned laterally
 25 adjacent each other with their bottom surfaces (such as the bottom surface **138** of the base body **104**) on the compacted sand or gravel **230** after the base bodies are already formed. The base bodies are thus pre-cast. The bottom surfaces are relatively large, which distributes weight of wall blocks over relatively large areas and may prevent or reduce settling. Front sides (such as the front side **120** of the base body **104**) face away from material to be retained
 30 by the system **100**, such as soil or other earth behind the base **102** (on rear sides of the base

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bodies such as the rear side **122** of the base body **104**) and behind the trench **224**. The base bodies may be positioned generally linearly so that their front surfaces are collinear, or the base bodies may be positioned along one or more curves.

A perforated pipe **236**, made of polyvinyl chloride ("PVC") and having a diameter of
 5 about 2.875 inches or about 3 inches (or about 73 millimeters or about 75 millimeters), may be positioned laterally across the base bodies **104** and **106** and received in the generally semi-cylindrical recesses (such as the generally semi-cylindrical recess **148**) of the base bodies.

Referring to FIG. 6, once the base bodies **104** and **106** are positioned as shown in FIG. 5, a hole **238** may be created under the through-opening **128** in the compacted sand or gravel
 10 **230** and in pre-existing soil, earth, or other material **242** under the base body **104**, and a hole **240** may be created under the through-opening **130** in the compacted sand or gravel **230** and in the pre-existing soil, earth, or other material **242** under the base body **104**. The holes **238** and **240** have diameters of about 10 inches (or about 25 centimeters) to about 12 inches (or about 30 centimeters) for example to match the diameters of the through-openings **128** and **130**
 15 respectively. In general, holes below the through-openings (such as the through-openings **128** and **130**) may be created using a post-hole-style auger (for sand, silt, or clay, for example) or vacuum excavation (for gravel or for gravelly soil, for example).

Referring to FIG. 7, a pile **244** may be positioned in the hole **238** with an upper edge
 20 **246** of the pile **244** generally coplanar with the support surface **146** of the base body **104**, and a pile **248** may be positioned in the hole **240** with an upper edge **250** of the pile **248** generally coplanar with the support surface **146**. The diameters, lengths, and other properties of the piles in various embodiments may vary depending on soil conditions, the overall height of the retaining wall of the system **100**, and other factors. In some embodiments, the piles **244** and **248** are steel pipes that may have diameters between about 4 inches and about 10 inches (or
 25 between about 10 centimeters and about 25 centimeters), or about 6 inches (or about 15 centimeters) or about 8 inches (or about 20 centimeters), for example, and may have lengths up to about 5 feet (or up to about 1.5 meters) extending vertically into the pre-existing soil, earth, or other material **242** under the base body **104**. In some embodiments, the piles **244** and **248** are American National Standards Institute ("ANSI") Schedule 40 micropiles of ASTM

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International A106 Grade B steel extending about 4 feet (or about 1.2 meters) below the top surface of the compacted sand or gravel **230**.

A flexible cable **252** has a loop **254** at one end and a free end shown generally at **256** and opposite the end having the loop **254**. The flexible cable **252** may be positioned through
 5 the pile **248** with the loop **254** completely through the pile **248**, and with the free end **256** freely extending above the base body **104**. The flexible cable **252** is a galvanized or stainless steel cable having a diameter of about 0.625 inches (or about 1.6 centimeters) and a breaking strength of about 46,000 pounds (or about 205,000 newtons) or about 50,000 pounds (or about 222,500 newtons) or more. The cables in other embodiments may vary, for example for higher
 10 loads that may be required in other embodiments. In the embodiment shown, the loop **254** remains through but near a bottom end of the pile **248**. However, in other embodiments, the flexible cable **252** may, after extending through the pile **248**, extend upward from the bottom end of the pile **248** and outside of the pile **248** such that the loop **254** is exposed above the top surface **146** of the base body **104**, which may facilitate inspecting the position of the loop **254**.

Once the flexible cable **252** is positioned through the pile **248**, concrete **257** (for
 15 example foundation concrete or F-2 concrete with a compressive force of at least about 30 megapascals or at least about 4,350 pounds per square inch) may be poured into the hole **238** and into the through-opening **128** to fill a space surrounding the pile **244** in the hole **238** and in the through-opening **128**, and concrete **258** (which may be the same material as the concrete
 20 **257**) may be poured into the hole **240** and into the through-opening **130** to fill a space surrounding the pile **248** in the hole **240** and in the through-opening **130**.

Piles such as those described herein may include cuts or welds to enhance their attachment to the surrounding concrete. Additionally or alternatively, piles such as those described herein may include holes that receive rebar or other material extending generally
 25 diametrically across the piles and generally radially outward from the piles. Such rebar or other material may be held in place with nuts, bolts, or other structure and may also enhance attachment of the piles to the surrounding concrete.

Piles such as those described herein may provide flexural strength to the structures in the holes **238** and **240**. Further, the concrete **257** and **258** engages with material surrounding
 30 the piles **244** and **248** respectively, including the sand or gravel **230** and the pre-existing soil,

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earth, or other material **242** under the base body **104**, and resists shear movement, uplift, compression, and dynamic forces. The piles **244** and **248** thus engage the pre-existing soil, earth, or other material **242** under the base body **104**. Further, concrete **258** engages the loop **254** or other portions of the flexible cable **252** to attach the flexible cable **252** to the concrete **258**. The concrete **257** and **258** is poured up to the top surface **146** of the base body **104**, so the concrete **257** attaches the pile **244** to the base body **104** and the concrete **258** attaches the pile **248** to the base body **104**.

Referring to FIGS. 1 and 8, wall blocks may be stacked on the base **102** with the wall blocks **108**, **110**, and **112** in the stack **107** on the base body **104**, and with the wall blocks **114**, **116** and **118** in the stack **113** on the base body **106**. In the embodiment shown in FIG. 1, in the bottom wall blocks **112** and **118**, a bottom portion of the portions on the front side having the images depicting the generally vertical wood board (corresponding to the generally vertical wood board **174**) may be removed to allow front surfaces of the bottom wall blocks **112** and **118** to abut retaining projections such as the retaining projection **140**. In other embodiments, such bottom portions may remain; in such embodiments, such bottom portions cause a gap between the front surfaces of the bottom wall blocks and the retaining projections of the base bodies, and such a gap may be filled with gravel.

As indicated above, each of the wall blocks **108**, **110**, **112**, **114**, **116**, and **118** has a height (illustrated as the height **212** in FIG. 3) of about 35.375 inches (or about 89.9 centimeters), and the retaining projections of the base bodies (such as the retaining projection **140** of the base body **104**) have a height of about 6 inches (or about 15 centimeters) above the support surfaces of the base bodies (such as the support surface **146** of the base body **104**). Therefore, the system **100** has an overall height **260** of about 100.125 inches (or about 254 centimeters) about the retaining projections (such as the retaining projection **140** of the base body **104**).

Referring to FIG. 9, a filter cloth or drain cloth **262** may be positioned on rear sides (such as the rear side **162** shown in FIGS. 3 and 4) of the wall blocks **108**, **110**, **112**, **114**, **116**, and **118**, and the rear attachment loops (such as the rear attachment loops **206**, **208**, and **210**) of the wall blocks **108**, **110**, **112**, **114**, and **116** may protrude through respective openings cut in the filter cloth or drain cloth **262**.

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As shown in FIG. 9, the wall block **108** may be attached, at the rear side **162** and externally to the wall block **108**, to the base body **104** by attaching the free end **256** of the flexible cable **252** to the central rear attachment loop **206**, for example by applying tension using a come-a-long winch and fastening the free end **256** of the flexible cable **252** to the central rear attachment loop **206** after such tension is applied. The flexible cable **252** is attached to the base body **104** at a portion of the base body **104** that extends rearward from the rear side **162** of the wall block **108**, so the flexible cable **252** attaches the wall block **108** at the rear side **162** to a portion of the base body **104** that extends rearward from the rear side **162** of the wall block **108**, and the flexible cable **252** also extends rearward from the rear side **162** of the wall block **108**. Likewise, a flexible cable **264** may be attached to the base body **106** and to a central rear attachment loop **266** (corresponding to the central rear attachment loop **206** of the wall block **108**) on the wall block **114** to attach the wall block **114**, at the rear side, to the base body **106**.

Still further, a flexible cable **268** may be attached to the central attachment loop **150** on the base body **104** and to a central rear attachment loop **270** (corresponding to the central rear attachment loop **206** on the wall block **108**) on the wall block **112** to attach the wall block **112**, at the rear side and externally to the wall block **112**, to the base body **104**, and a flexible cable **272** may be attached to a central attachment loop **274** (corresponding to the central attachment loop **150** of the base body **104**) on the base body **106** and to a central rear attachment loop **276** (corresponding to the central rear attachment loop **206** on the wall block **108**) on the wall block **118** to attach the wall block **118**, at the rear side, to the base body **106**. The central attachment loops **150** and **274** are on respective portions of the base bodies **104** and **106** that extend rearward from the rear side of the wall blocks **112** and **118**, so the flexible cables **268** and **272** also attach the wall blocks **112** and **118**, at the rear sides, to respective portions of the base bodies **104** and **106** that extend rearward from the rear side of the wall blocks **112** and **118**, and the flexible cables **268** and **272** also extend rearward from the rear side of the wall blocks **112** and **118**.

Still further, the wall blocks **108**, **110**, **112**, **114**, **116**, and **118** may be attached, externally and at the rear side, to the base bodies **104** and **106** by lacing adjacent lateral attachment loops of the base bodies **104** and **106** and of the wall blocks **108**, **110**, **112**, **114**,

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116, and 118. For example, a flexible cable **278** may be attached to the lateral attachment loop **152** on the base body **104** and passed through a lateral rear attachment loop **280** (corresponding to the lateral rear attachment loop **210** on the wall block **108**) on the wall block **118** (the lowest wall block in the stack **113**), through a lateral rear attachment loop **282** (corresponding to the lateral rear attachment loop **208** on the wall block **108**) on the wall block **110** (in the stack **107** and in a row above the wall block **118**), and attached to a lateral rear attachment loop **284** (corresponding to the lateral rear attachment loop **210** on the wall block **108**) on the wall block **114** (in the stack **113** and in a row above the wall block **110**).

Further, a flexible cable **286** may be attached to a lateral attachment loop (corresponding to the lateral attachment loop **154**) on the base body **106** and passed through a lateral rear attachment loop **288** (corresponding to the lateral rear attachment loop **208** on the wall block **108**) on the wall block **112** (the lowest wall block in the stack **107**), through a lateral rear attachment loop **290** (corresponding to the lateral rear attachment loop **210** on the wall block **108**) on the wall block **116** (in the stack **113** and in a row above the wall block **112**), and attached to the lateral rear attachment loop **208** on the wall block **108** (in the stack **107** and in a row above the wall block **116**).

In other words, each of the flexible cables **278** and **286** attaches: the rear side of at least one of wall blocks in a first stack of the plurality of wall blocks; the rear side of at least one of wall blocks in a second stack of the plurality of wall blocks adjacent the first stack; and a ground-stabilizing base body supporting the wall blocks in one of the first and second stacks. Further, the at least one of the wall blocks in the first stack and the at least one of the wall blocks in the second stack are in alternating rows of the first and second stacks, and the flexible cable extends diagonally from the rear side of the at least one of the wall blocks in the first stack to the rear side of the at least one of the wall blocks in the second stack. As the flexible cables **278** and **286** are tensioned, the flexible cables slide against respective attachment surfaces on the attachment loops **280**, **282**, **288**, and **290**. The flexible cables **278** and **286** may increase the resistance of the system **100** to earthquake forces, for example.

Like the flexible cable **252**, the flexible cables **264**, **268**, and **272** may be formed from galvanized or stainless steel cables having a diameter of about 0.625 inches (or about 1.6 centimeters) with breaking strengths of about 46,000 pounds (or about 205,000 newtons) or

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about 50,000 pounds (or about 222,500 newtons) or more. Further, tension on the flexible cables **252**, **264**, **268**, and **272** may be about 300 pounds (or about 1,335 newtons) or more, about 1,000 pounds (or about 4,450 newtons), about 4,000 pounds (or about 17,800 newtons), or about 5,000 pounds (or about 22,250 newtons) or more depending on factors including the
 5 overall height **260** and soil conditions surrounding the system **100**.

Referring to FIGS. 9 and 10, once the system **100** is constructed as described above, the material **291** is positioned against the filter cloth or drain cloth **262**, and generally cylindrical drainage inlets (such as the generally cylindrical drainage inlets **186** and **188** on wall block **108** as shown in FIG. 4) of the blocks **108**, **110**, **112**, **114**, **116**, and **118** receive
 10 liquid from the material **291** through the filter cloth or drain cloth **262**. As indicated above, the generally cylindrical drainage channels (such as the generally cylindrical drainage channels **182** and **184** on the wall block **108**) of the wall blocks **108**, **110**, **112**, **114**, **116**, and **118** form continuous drainage channels in each stack of wall blocks and throughout the entire height of each stack of wall blocks. The continuous drainage channels in each stack of wall blocks may
 15 be filled with material (such as fracture-faced gravel, 0.75-inch or 19-milimeter clear crushed gravel, or other gravel, for example) and may receive liquid from the generally cylindrical drainage inlets (such as the generally cylindrical drainage inlets **186** and **188** on the wall block **108** as shown in FIG. 4). The bottom of each continuous drainage channel is above one of the base bodies, so the wall blocks are configured to direct liquid from the rear side of the
 20 plurality of wall blocks to the base bodies.

The continuous drainage channels in the stacks of wall blocks are positioned above the perforated pipe **236**, so that liquid received in the continuous drainage channels can drain into the perforated pipe **236** and out of the system **100** at one or both ends of the perforated pipe **236**, for example to a storm drain or another disposal system that may be appropriate.

25 As shown in FIG. 10, material **291** (such as native granular soil, or “3-inch minus” or “75-millimeter minus” gravel, compacted to 95% SPMDD, for example) may be positioned against the filter cloth or drain cloth **262** and retained against the rear side of the wall blocks **108**, **110**, **112**, **114**, **116**, and **118**. The system **100** thus functions as a retaining wall to retain the material **291**. The material **291** is positioned above portions of the base bodies that extend
 30 behind the rear side of the wall blocks, and the weight of the material **291** on such portions of

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the base bodies may help to prevent overturning of the system **100**. As indicated above, the flexible cables **252** and **264** attach the wall blocks **108** and **114** to the portions of the base bodies that extend behind the rear side of the wall blocks, so the weight of the material **291** on such portions may hold the wall blocks **108** and **114** in place. Further, holding the wall blocks

5 **108** and **114** in place may more generally hold the stacks **107** and **113** in place because the wall blocks **108** and **114** are coupled to other wall blocks in the stacks **107** and **113**.

On a front side of the system **100**, additional material **292** may be positioned to restore a natural grade at a level generally parallel to the top edge of the retaining projections (such as the retaining projection **140** shown in FIGS. 1, 2, and 5-7) of the base bodies **104** and **106**.

10 Alternative embodiments may include different numbers of base bodies and different numbers of wall blocks in different numbers of stacks. For example, referring to FIG. 11, a retaining wall system according to another embodiment is shown generally at **293** and includes a stack of wall blocks shown generally at **294** and supported by a base body **295**, a stack of wall blocks shown generally at **296** adjacent the stack **294** and supported by a base

15 body **297**, and a stack of wall blocks shown generally at **298** adjacent the stack **296** and supported by a base body **299**. The wall blocks in the stacks **294**, **296**, and **298** are substantially the same as the wall block **108**, and the base bodies **295**, **297**, and **299** are substantially the same as the base body **104**. The stacks **294**, **296**, and **298** each include seven wall blocks each having a height (substantially the same as the height **212** shown in FIG. 3) of

20 about 35.375 inches (or about 89.9 centimeters). Retaining projections (corresponding to the retaining projection **140** shown in FIGS. 1, 2, and 5-7) of the base bodies **295**, **297**, and **299** have heights of about 6 inches (or about 15.3 centimeters) above surfaces of the base bodies **295**, **297**, and **299** supporting the wall blocks. Therefore, the system **293** has an overall height **300** of over 20 feet, more particularly about 241.625 inches (or about 614 centimeters) above

25 top edges of the retaining projections of the base bodies **295**, **297**, and **299**.

The system **293** may be constructed according to a method similar to the method described above with reference to FIGS. 5-10. For example, a filter cloth or drain cloth may be positioned against rear surfaces of the wall blocks, although a filter cloth or drain cloth is not shown in FIG. 11 for simplicity of illustration. Further, the flexible cables and tensions

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described below with reference to FIG. 11 may be the same materials and tensions as described above with reference to FIG. 9.

Wall blocks in a second (counting from the bottom) row shown generally at **301** of the seven rows of the wall blocks in the system **293** include: a wall block **302** having a central rear attachment loop **304** (corresponding to the central rear attachment loop **206** shown in FIG. 4) attached to a flexible cable **306** attached to a central attachment loop **308** (corresponding to the central attachment loop **150** shown in FIG. 5) of the base body **299**; a wall block **310** having a central rear attachment loop **312** (corresponding to the central rear attachment loop **206** shown in FIG. 4) attached to a flexible cable **314** attached to a central attachment loop **316** (corresponding to the central attachment loop **150** shown in FIG. 5) of the base body **297**; and a wall block **318** having a central rear attachment loop **320** (corresponding to the central rear attachment loop **206** shown in FIG. 4) attached to a flexible cable **322** attached to a central attachment loop **324** (corresponding to the central attachment loop **150** shown in FIG. 5) of the base body **295**.

Further, wall blocks in a sixth (counting from the bottom) row shown generally at **324** of the seven rows of the wall blocks in the system **293** includes: a wall block **326** having a central rear attachment loop **328** (corresponding to the central rear attachment loop **206** shown in FIG. 4) attached to a free end **330** of a flexible cable **332** (corresponding to the flexible cable **252** shown in FIGS. 7-9) attached to the base body **299** and to a pile of the base body **299**; a wall block **334** having a central rear attachment loop **336** (corresponding to the central rear attachment loop **206** shown in FIG. 4) attached to a free end **338** of a flexible cable **340** (corresponding to the flexible cable **252** shown in FIGS. 7-9) attached to the base body **297** and to a pile of the base body **297**; and a wall block **342** having a central rear attachment loop **344** (corresponding to the central rear attachment loop **206** shown in FIG. 4) attached to a free end **346** of a flexible cable **348** (corresponding to the flexible cable **252** shown in FIGS. 7-9) attached to the base body **295** and to a pile of the base body **295**.

In the embodiment of FIG. 11, the second and sixth (counting from the bottom) rows **301** and **324** were chosen based on the overall height **300** and particular lateral soil load, drainage conditions, earthquake loading, and other external surcharge loading conditions. In other embodiments, retaining wall systems may have different overall heights, and the rows

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that are attached to the base bodies may differ according to factors such as the overall height, lateral soil load, drainage conditions, earthquake loading, and other external surcharge loading conditions.

Further, adjacent lateral rear attachment loops of the wall blocks in adjacent columns of the system **293** may be attached using flexible cables **350**, **352**, **354**, and **356** as shown in FIG. 11. As shown in FIG. 11, each of the flexible cables **350**, **352**, **354**, and **356** attaches: the rear side of at least one of wall blocks in a first stack of the plurality of wall blocks; the rear side of at least one of wall blocks in a second stack of the plurality of wall blocks adjacent the first stack; and a ground-stabilizing base body supporting the wall blocks in one of the first and second stacks. Further, the at least one of the wall blocks in the first stack and the at least one of the wall blocks in the second stack are in alternating rows of the first and second stacks, and the flexible cable extends diagonally from the rear side of the at least one of the wall blocks in the first stack to the rear side of the at least one of the wall blocks in the second stack.

In embodiments such as those described herein, base bodies are connected to piles, which extend into and engage material under the base bodies. By extending into and engaging material under the base bodies, the piles (and thus the base bodies including and attached to the piles) may stabilize the material under the base bodies, may increase the bearing capacity of the material under the base bodies, and may prevent movement of the base bodies laterally, vertically, and rotationally relative to the material under the base bodies. Base bodies in embodiments such as those described herein are thus ground-stabilizing base bodies.

Further, attaching wall blocks to the base bodies in embodiments such as those described herein may support the wall blocks relative to the base bodies and relative to the piles, which may also prevent movement of the wall blocks laterally, vertically, and rotationally relative to the material under the base bodies independently of geogrid, independently of reinforced earth, and independently of any structure in the material retained against the rear side of the wall blocks.

Therefore, embodiments such as those described herein may be supported against lateral pushout, overturning, global failure, static forces, and earthquake forces, for example, and may be so supported with significantly less excavation of backfill regions than would be

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required retaining walls using reinforced earth such as geogrid, for example. Further, backfill material in embodiments such as those described herein may be readily available native earth or other inexpensive materials, rather than more-expensive materials that may be required for constructing reinforced earth, so embodiments such as those described herein may not only
5 allow for less excavation when compared to retaining walls using reinforced earth, but may also avoid costs of discarding of excavated material and acquiring replacement material for constructing reinforced earth.

Although specific embodiments have been described and illustrated, such embodiments should be considered illustrative only and not as limiting the invention as
10 construed according to the accompanying claims.

CLAIMS

1. A method of stabilizing a retaining wall comprising a plurality of wall blocks positioned to retain material against a rear side of the plurality of wall blocks, the method comprising attaching the rear side of a first one of the plurality of wall blocks to the rear side
5 of a second one of the plurality of wall blocks; wherein:

the first one of the plurality of wall blocks is in a first row of the plurality of wall blocks;

the first one of the plurality of wall blocks is in a first stack of the plurality of wall blocks;

10 the second one of the plurality of wall blocks is in a second row of the plurality of wall blocks on a vertical side of the first row of the plurality of wall blocks;

the second one of the plurality of wall blocks is in a second stack of the plurality of wall blocks on a lateral side of the first stack of the plurality of wall blocks; and

15 attaching the rear side of the first one of the plurality of wall blocks to the rear side of the second one of the plurality of wall blocks comprises applying tension to a first flexible cable attached to the rear side of the first one of the plurality of wall blocks, attached to the rear side of the second one of the plurality of wall blocks, and comprising a portion extending diagonally between the rear side of the first one of the plurality of wall blocks and the rear side of the second one of the plurality of wall blocks.

20 2. The method of claim 1 further comprising attaching at least one of the plurality of wall blocks to at least one ground-stabilizing base body supporting at least the first stack of the plurality of wall blocks.

25 3. The method of claim 2 wherein the at least one of the plurality of wall blocks is in the first stack of the plurality of wall blocks, and wherein attaching the at least one of the plurality of wall blocks to the at least one ground-stabilizing base body comprises applying tension to a second flexible cable attached to the rear side of the at least one of the plurality of wall blocks and to a portion of the at least one ground-stabilizing base body extending rearward from the rear side of the at least one of the plurality of wall blocks with the second flexible cable extending rearward away from the rear side of the at least one of the plurality of wall blocks.

4. The method of claim 3 wherein the second flexible cable is attached, independently from the at least one ground stabilizing base body, to a pile attached to the portion of the at least one ground-stabilizing base body and engaging material under the at least one ground-stabilizing base body.

5. The method of claim 2 wherein applying tension to the first flexible cable comprises applying tension to the first flexible cable attached to:

the rear side of the first one of the plurality of wall blocks;

the rear side of the second one of the plurality of wall blocks; and

the at least one ground-stabilizing base body.

6. The method of claim 2 further comprising attaching at least one pile to the at least one ground-stabilizing base body.

7. The method of claim 6 further comprising engaging the at least one pile with material under the at least one ground-stabilizing base body.

8. The method of claim 7 wherein engaging the at least one pile with the material under the at least one ground-stabilizing base body comprises positioning concrete in at least one respective space between the at least one pile and the material under the at least one ground-stabilizing base body.

9. The method of claim 1 further comprising attaching the rear side of the first one of the plurality of wall blocks to the rear side of a third one of the plurality of wall blocks, wherein:

the third one of the plurality of wall blocks is in a third row of the plurality of wall blocks on a vertical side of the first row of the plurality of wall blocks vertically opposite the second row of the plurality of wall blocks;

the third one of the plurality of wall blocks is in the second stack of the plurality of wall blocks; and

attaching the rear side of the first one of the plurality of wall blocks to the rear side of the third one of the plurality of wall blocks comprises applying tension to the first flexible cable attached to the rear side of the third one of the plurality of wall blocks and comprising a

portion extending diagonally between the rear side of the first one of the plurality of wall blocks and the rear side of the third one of the plurality of wall blocks in.

10. The method of claim 1 wherein applying tension to the first flexible cable comprises:
sliding the first flexible cable against a first attachment surface on the rear side of the
5 first one of the plurality of wall blocks; and
sliding the first flexible cable against a second attachment surface on the rear side of
the second one of the plurality of wall blocks.

11. The method of claim 1 further comprising, when the at least one ground-stabilizing
base body is already formed and before supporting the plurality of wall blocks on the at least
10 one ground-stabilizing base body, positioning the at least one ground-stabilizing base body
into a position on a surface for supporting the plurality of wall blocks.

12. The method of claim 1 further comprising attaching the rear side of a third one of the
plurality of wall blocks to the rear side of a fourth one of the plurality of wall blocks, wherein:

the third one of the plurality of wall blocks is in the first row of the plurality of wall
15 blocks;

the third one of the plurality of wall blocks is in the second stack of the plurality of
wall blocks;

the fourth one of the plurality of wall blocks is in the second row of the plurality of
wall blocks;

20 the fourth one of the plurality of wall blocks is in the first stack of the plurality of wall
blocks; and

attaching the rear side of the third one of the plurality of wall blocks to the rear side of
the fourth one of the plurality of wall blocks comprises applying tension to a second flexible
cable attached to the rear side of the third one of the plurality of wall blocks, attached to the
25 rear side of the fourth one of the plurality of wall blocks, and comprising a portion extending
diagonally between the rear side of the third one of the plurality of wall blocks and the rear
side of the fourth one of the plurality of wall blocks.

13. The method of claim 1 wherein the blocks in the first row of the plurality of wall blocks are adjacent the blocks in the second row of the plurality of wall blocks, and wherein the blocks in the first stack of the plurality of wall blocks are adjacent the blocks in the second stack of the plurality of wall blocks.

- 5 14. A retaining wall system comprising:
a plurality of wall blocks retaining material on a rear side of the plurality of wall blocks; and
a first flexible cable;
wherein the plurality of wall blocks comprises a first one of the plurality of wall blocks
10 and a second one of the plurality of wall blocks;
wherein the first one of the plurality of wall blocks is in a first row of the plurality of wall blocks;
wherein the first one of the plurality of wall blocks is in a first stack of the plurality of wall blocks;
15 wherein the second one of the plurality of wall blocks is in a second row of the plurality of wall blocks on a vertical side of the first row of the plurality of wall blocks;
wherein the second one of the plurality of wall blocks is in a second stack of the plurality of wall blocks on a lateral side of the first stack of the plurality of wall blocks; and
wherein the first flexible cable is attached to the rear side of the first one of the
20 plurality of wall blocks, is attached to the rear side of the second one of the plurality of wall blocks, and comprises a portion extending diagonally between the rear side of the first one of the plurality of wall blocks and the rear side of the second one of the plurality of wall blocks.

15. The system of claim 14 further comprising at least one ground-stabilizing base body supporting at least the first stack of the plurality of wall blocks.

16. The system of claim 15 further comprising a second flexible cable attached to the rear side of at least one of the plurality of wall blocks in the first stack of the plurality of wall blocks, wherein:

the at least one ground-stabilizing base body comprises a portion extending rearward from the rear side of the at least one of the plurality of wall blocks in the first stack of the plurality of wall blocks;

the second flexible cable is attached to the rear side of the at least one of the plurality of wall blocks in the first stack of the plurality of wall blocks and to the portion of the at least one ground-stabilizing base body; and

the second flexible cable extends rearward away from the rear side of the at least one of the plurality of wall blocks in the first stack of the plurality of wall blocks.

17. The system of claim 16 wherein the second flexible cable is attached to a pile attached, independently from the at least one ground-stabilizing base body, to the portion of the at least one ground-stabilizing base body and engaging material under the at least one ground-stabilizing base body.

18. The system of claim 15 wherein the first flexible cable is further attached to the at least one ground-stabilizing base body.

19. The system of claim 15 further comprising at least one pile attached to the at least one ground-stabilizing base body and engaging material under the at least one ground-stabilizing base body.

20. The system of claim 19 further comprising concrete in a respective space between the at least one pile and the material under the at least one ground-stabilizing base body.

21. The system of claim 15 wherein the at least one ground-stabilizing base body supports the plurality of wall blocks independently of any structure, other than any structure attached to the at least one ground-stabilizing base body, in the material retained against the rear side of the plurality of wall blocks.

22. The system of claim 15 wherein the plurality of wall blocks collectively extend at least 12 feet above the at least one ground-stabilizing base body.

23. The system of claim 15 wherein the plurality of wall blocks collectively extend at least 15 feet above the at least one ground-stabilizing base body.

24. The system of claim 15 wherein the plurality of wall blocks collectively extend at least 20 feet above the at least one ground-stabilizing base body.

5 25. The system of claim 15 wherein:

the plurality of wall blocks define at least one drainage channel configured to direct liquid from the rear side of the plurality of wall blocks to the at least one ground-stabilizing base body; and

10 the at least one ground-stabilizing base body defines at least one drainage channel configured to direct liquid, from the at least one drainage channel of the plurality of wall blocks, out of the system.

26. The system of claim 14 wherein:

the plurality of wall blocks comprises a third one of the plurality of wall blocks;

the third one of the plurality of wall blocks is in a third row of the plurality of wall

15 blocks on a vertical side of the first row of the plurality of wall blocks vertically opposite the second row of the plurality of wall blocks;

the third one of the plurality of wall blocks is in the second stack of the plurality of wall blocks; and

20 the first flexible cable is attached to the rear side of the third one of the plurality of wall blocks and comprises a portion extending diagonally between the rear side of the first one of the plurality of wall blocks and the rear side of the third one of the plurality of wall blocks.

27. The system of claim 14 wherein:

the first flexible cable is slidably attached to the first one of the plurality of wall blocks at a first attachment surface of the first one of the plurality of wall blocks; and

25 the first flexible cable is slidably attached to the second one of the plurality of wall blocks in at a second attachment surface of the second one of the plurality of wall blocks.

28. The system of claim 14 wherein:

the plurality of wall blocks comprises a third one of the plurality of wall blocks and a fourth one of the plurality of wall blocks;

the third one of the plurality of wall blocks is in the first row of the plurality of wall blocks;

the third one of the plurality of wall blocks is in the second stack of the plurality of wall blocks;

the fourth one of the plurality of wall blocks is in the second row of the plurality of wall blocks;

the fourth one of the plurality of wall blocks is in the first stack of the plurality of wall blocks; and

a second flexible cable attaches the rear side of the third one of the plurality of wall blocks to the rear side of the fourth one of the plurality of wall blocks and comprises a portion extending diagonally between the rear side of the third one of the plurality of wall blocks and the rear side of the fourth one of the plurality of wall blocks.

29. The system of claim 14 wherein the blocks in the first row of the plurality of wall blocks are adjacent the blocks in the second row of the plurality of wall blocks, and wherein the blocks in the first stack of the plurality of wall blocks are adjacent the blocks in the second stack of the plurality of wall blocks.

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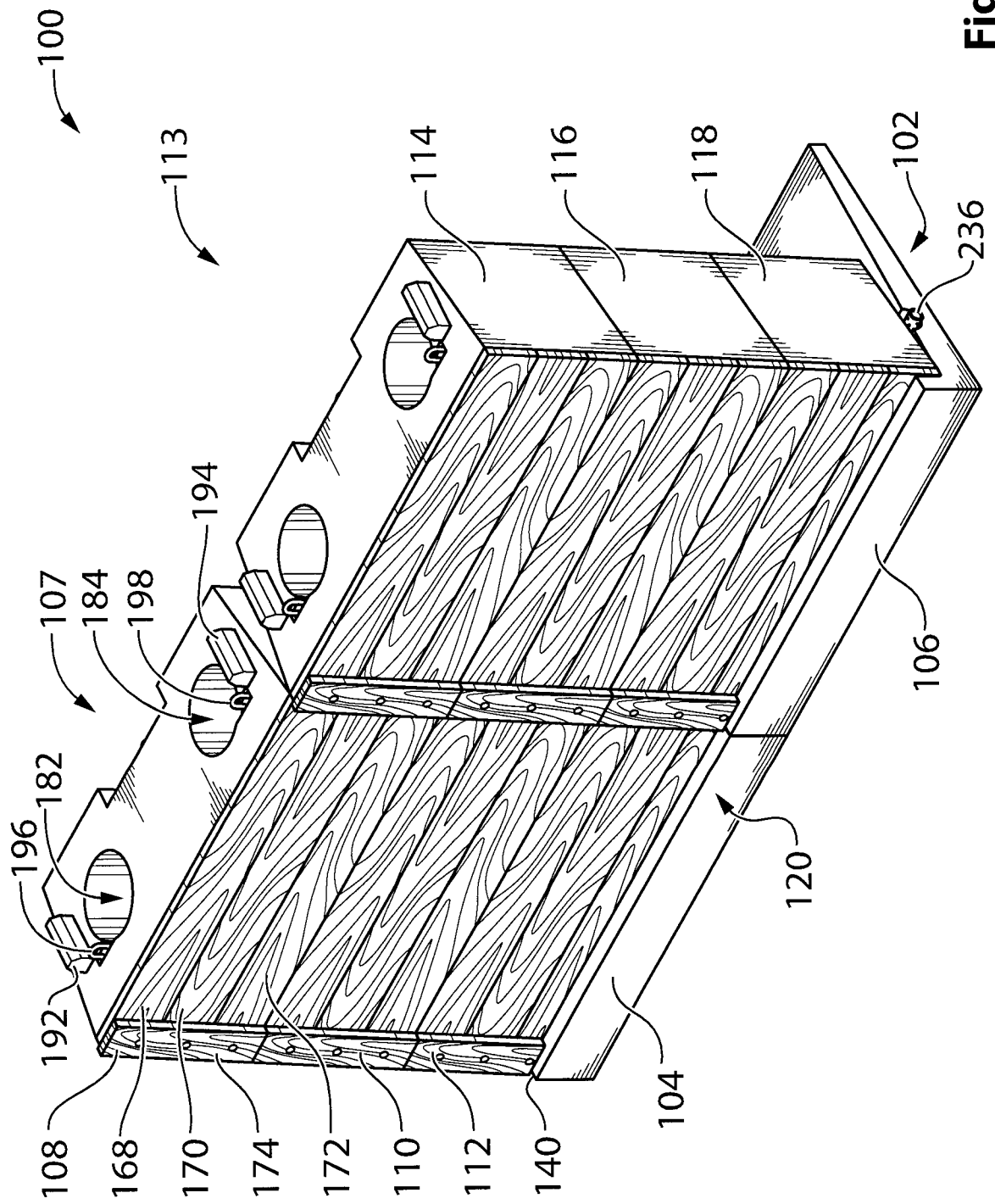


Fig. 1

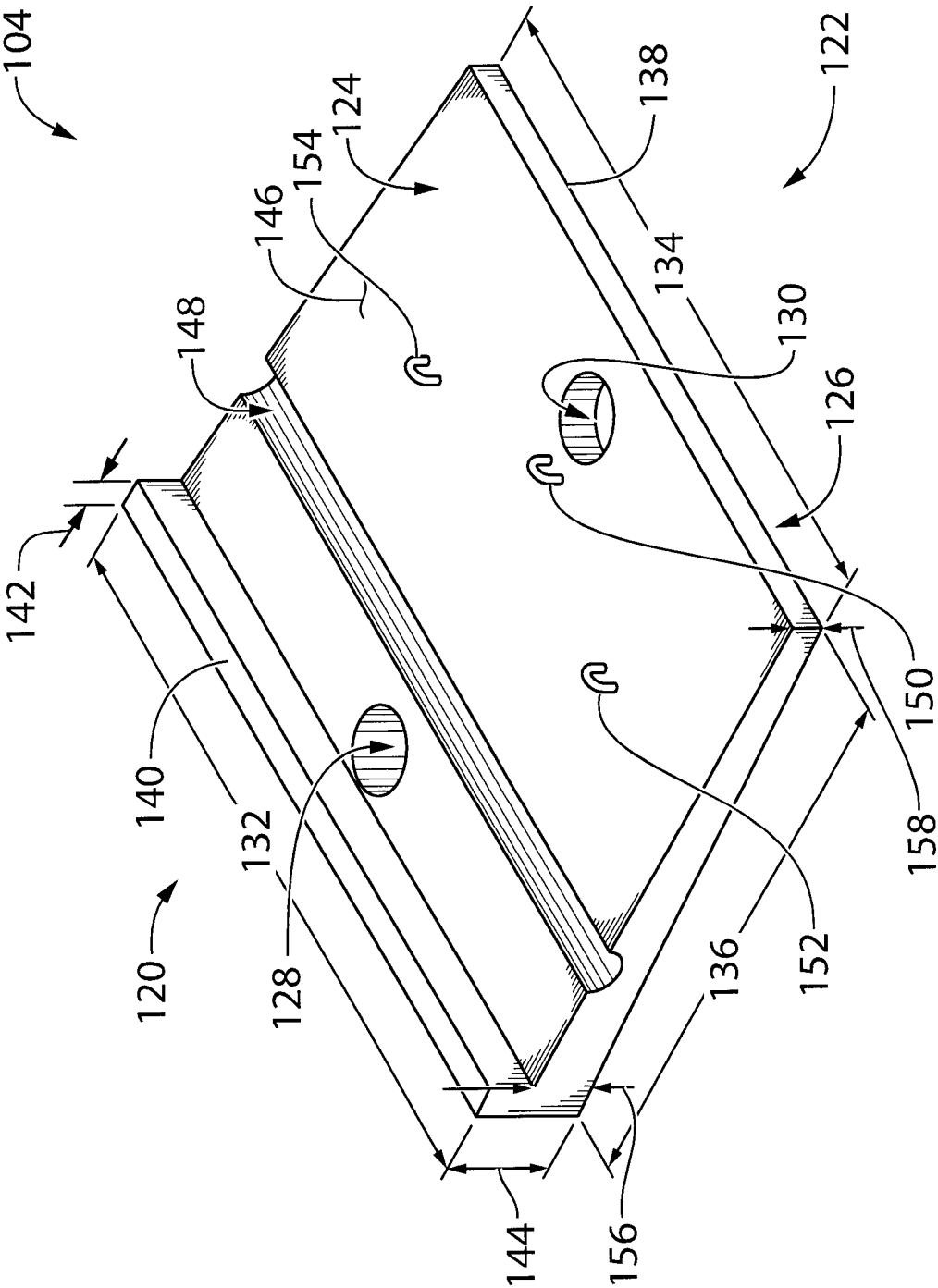


Fig. 2

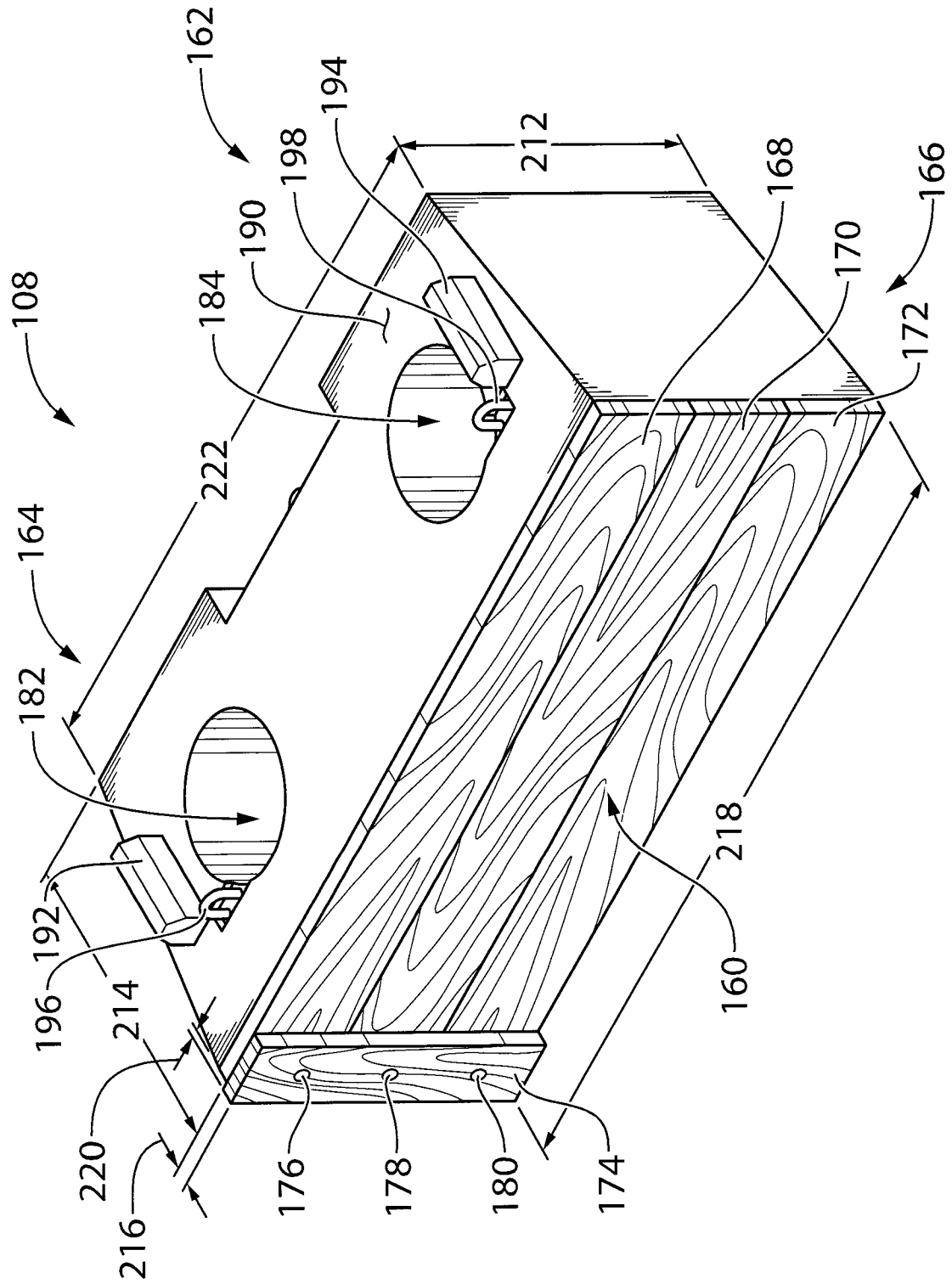


Fig. 3

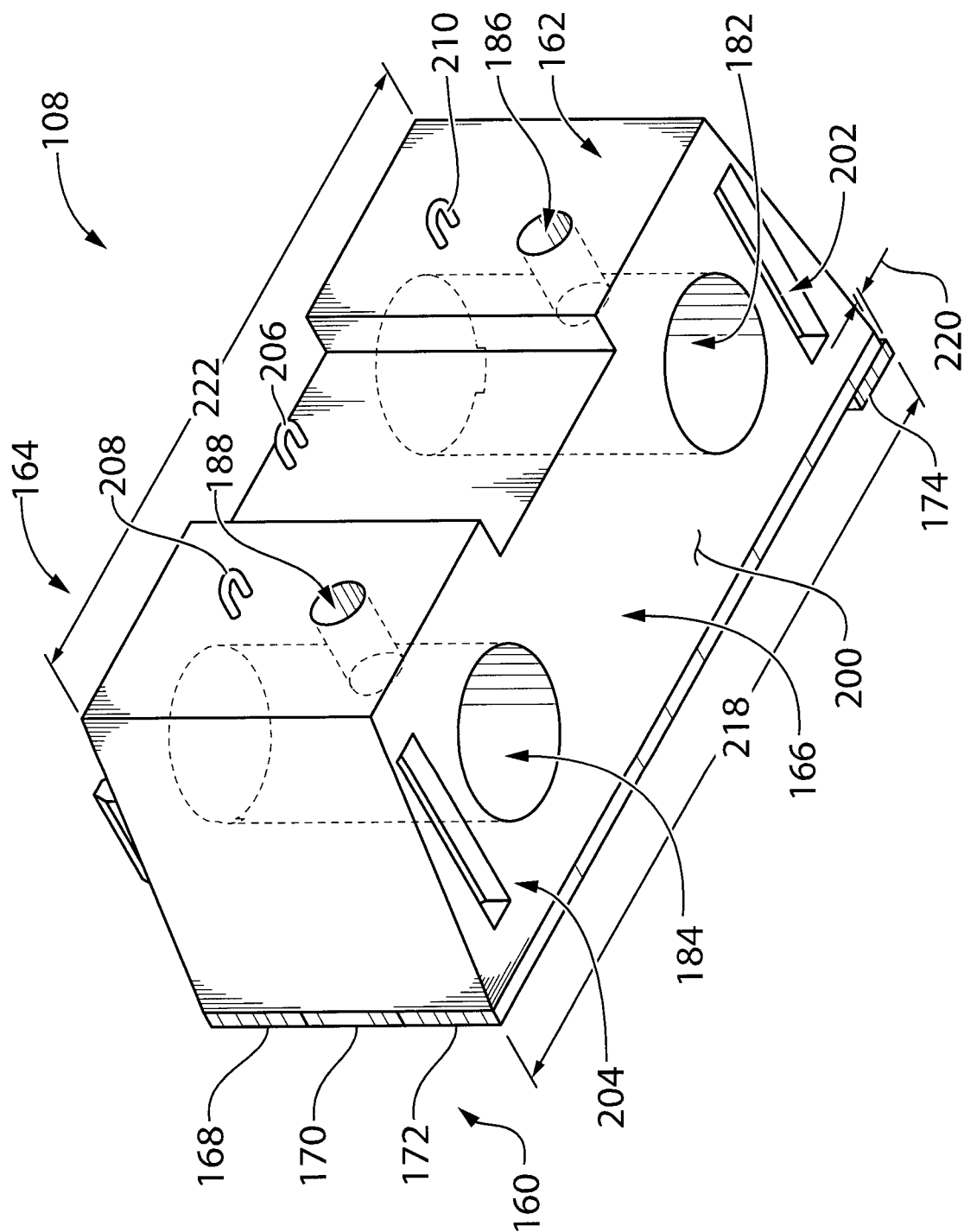
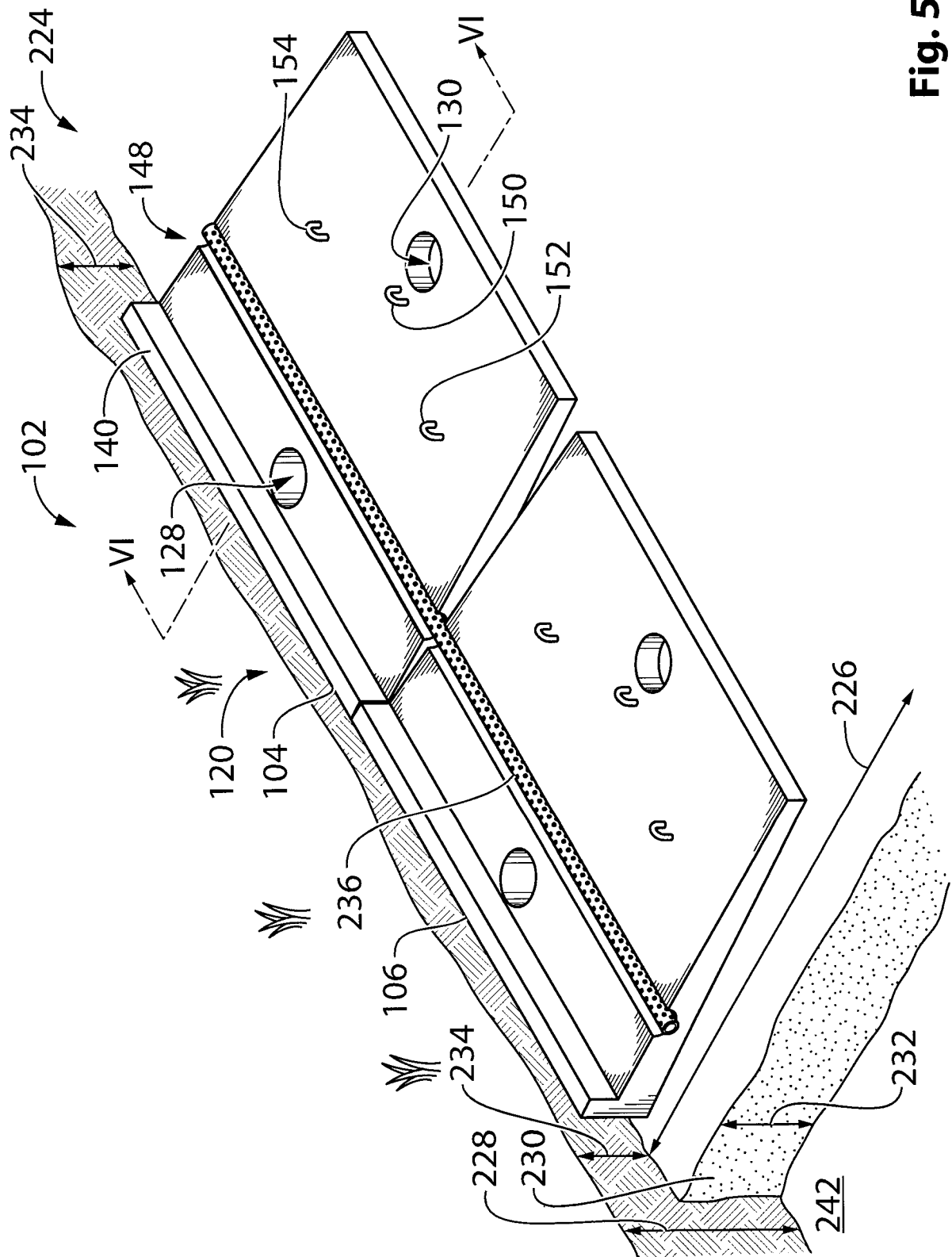


Fig. 4

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**Fig. 5**

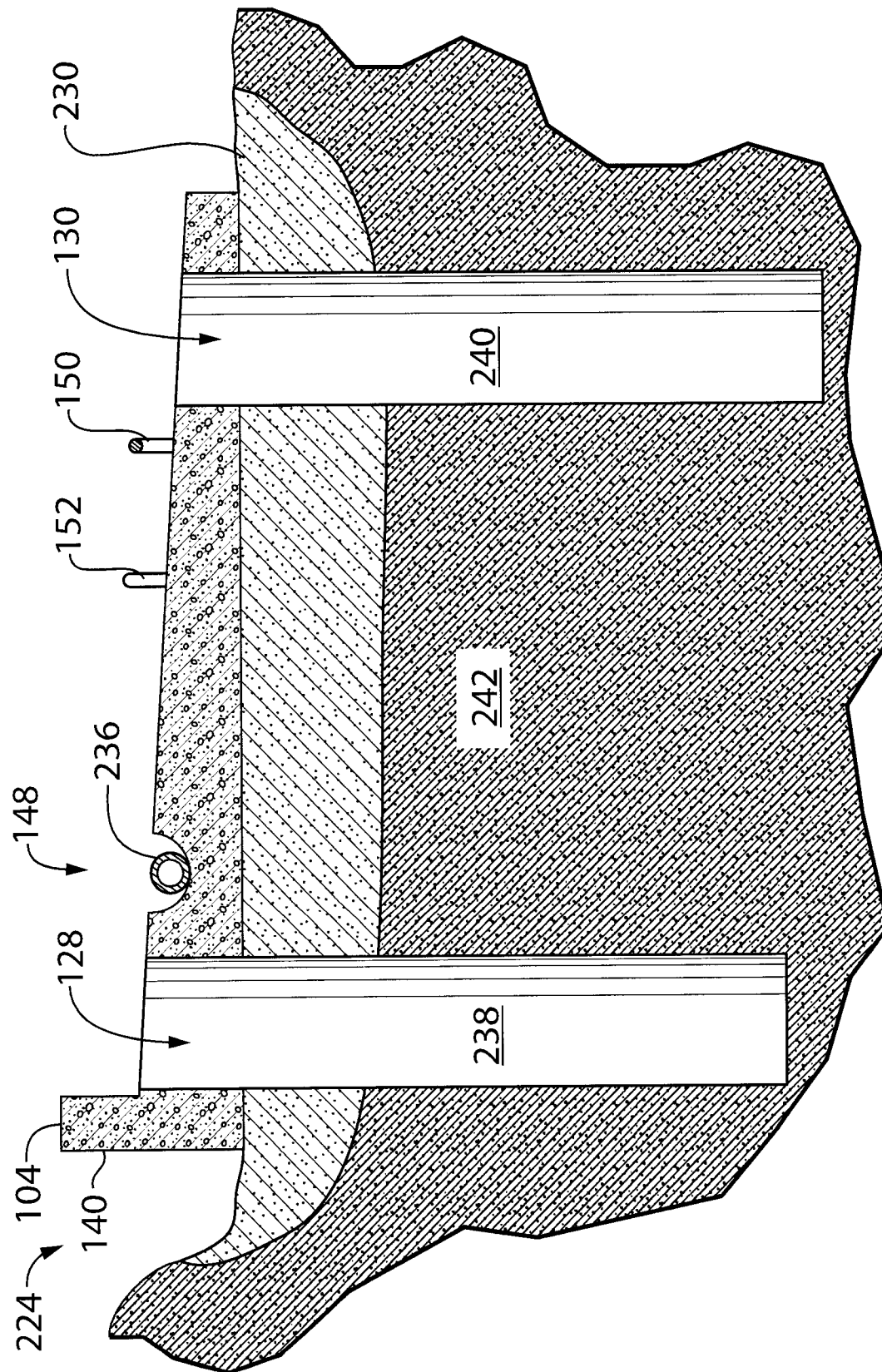
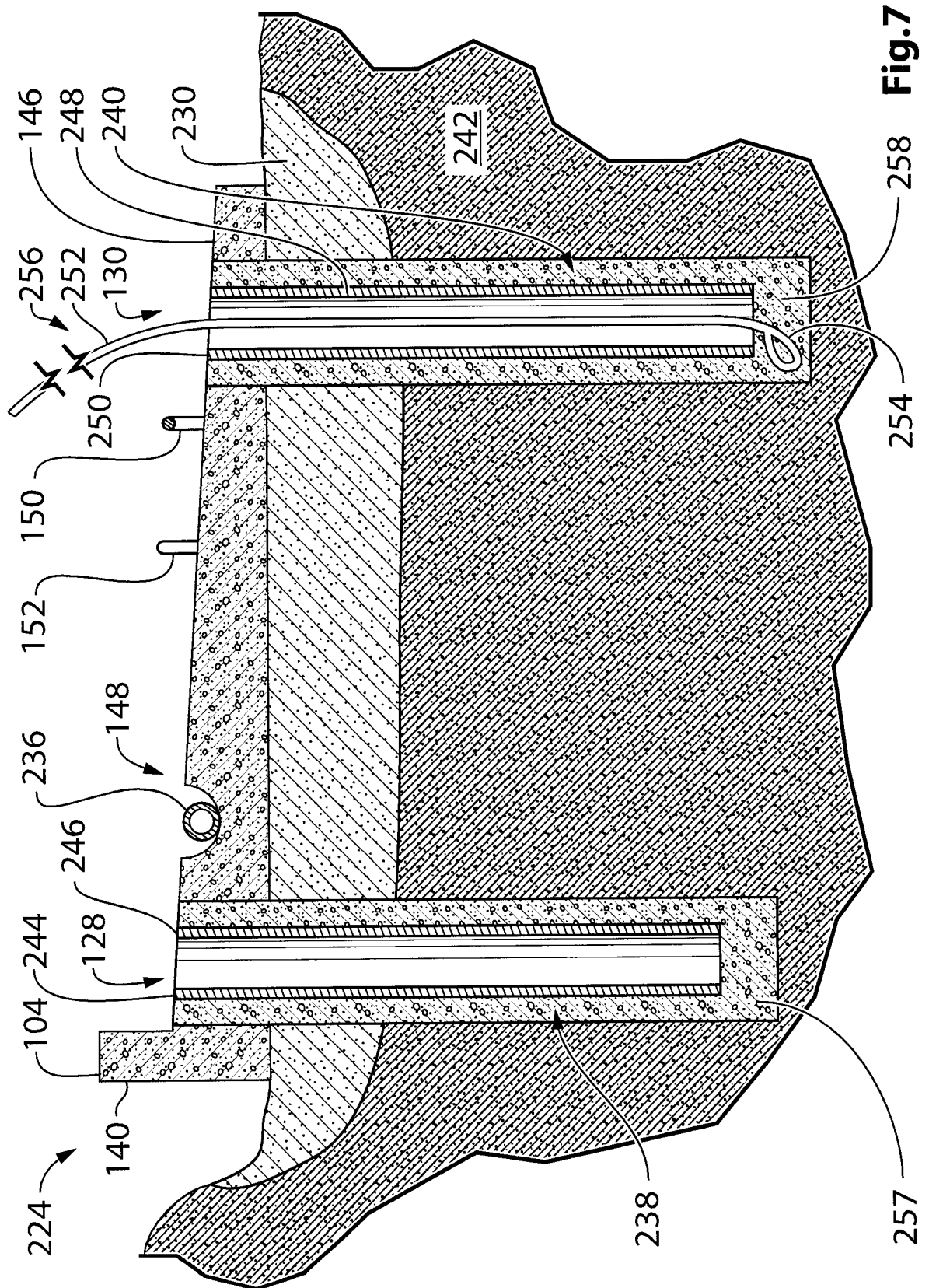


Fig. 6

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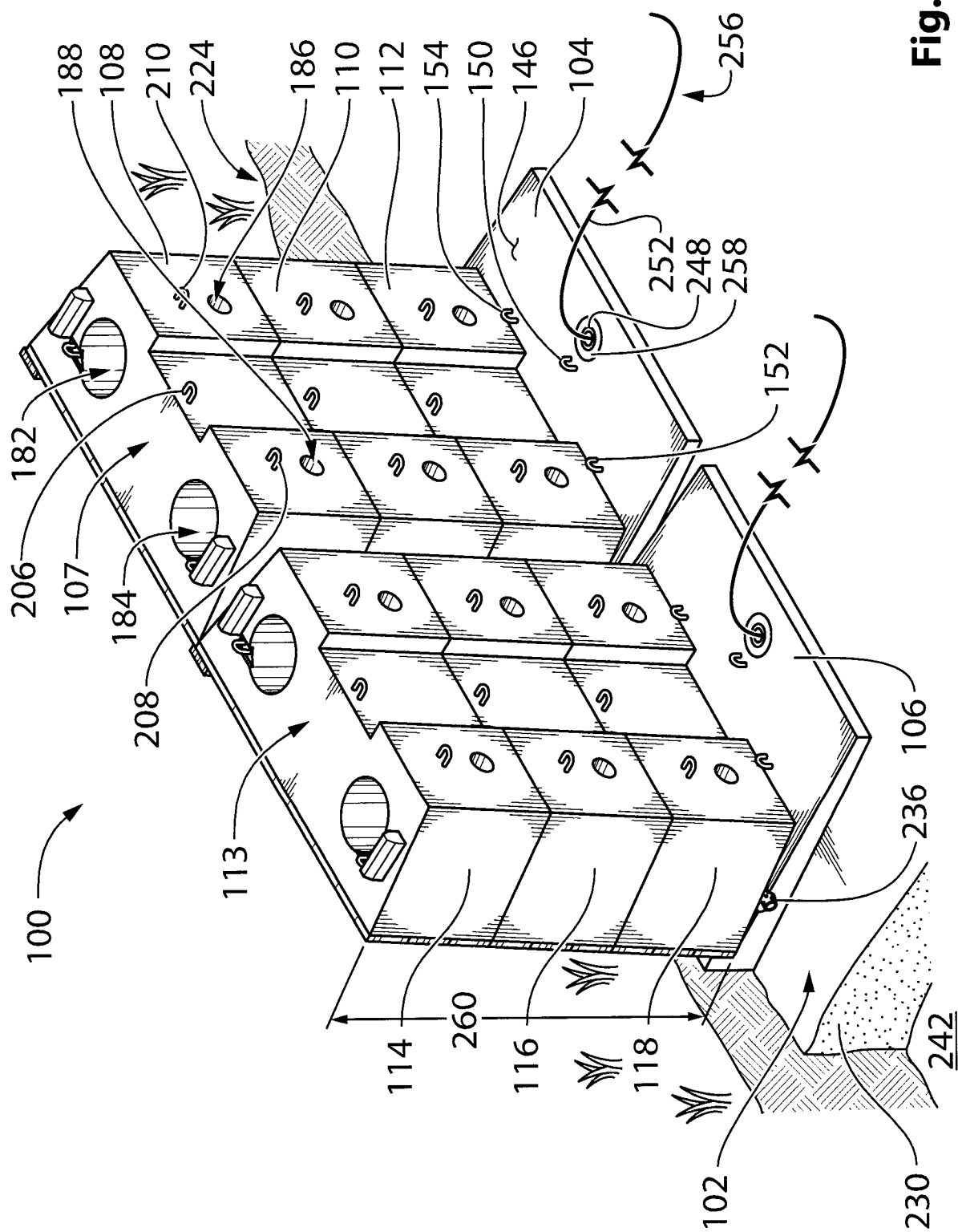


Fig. 8

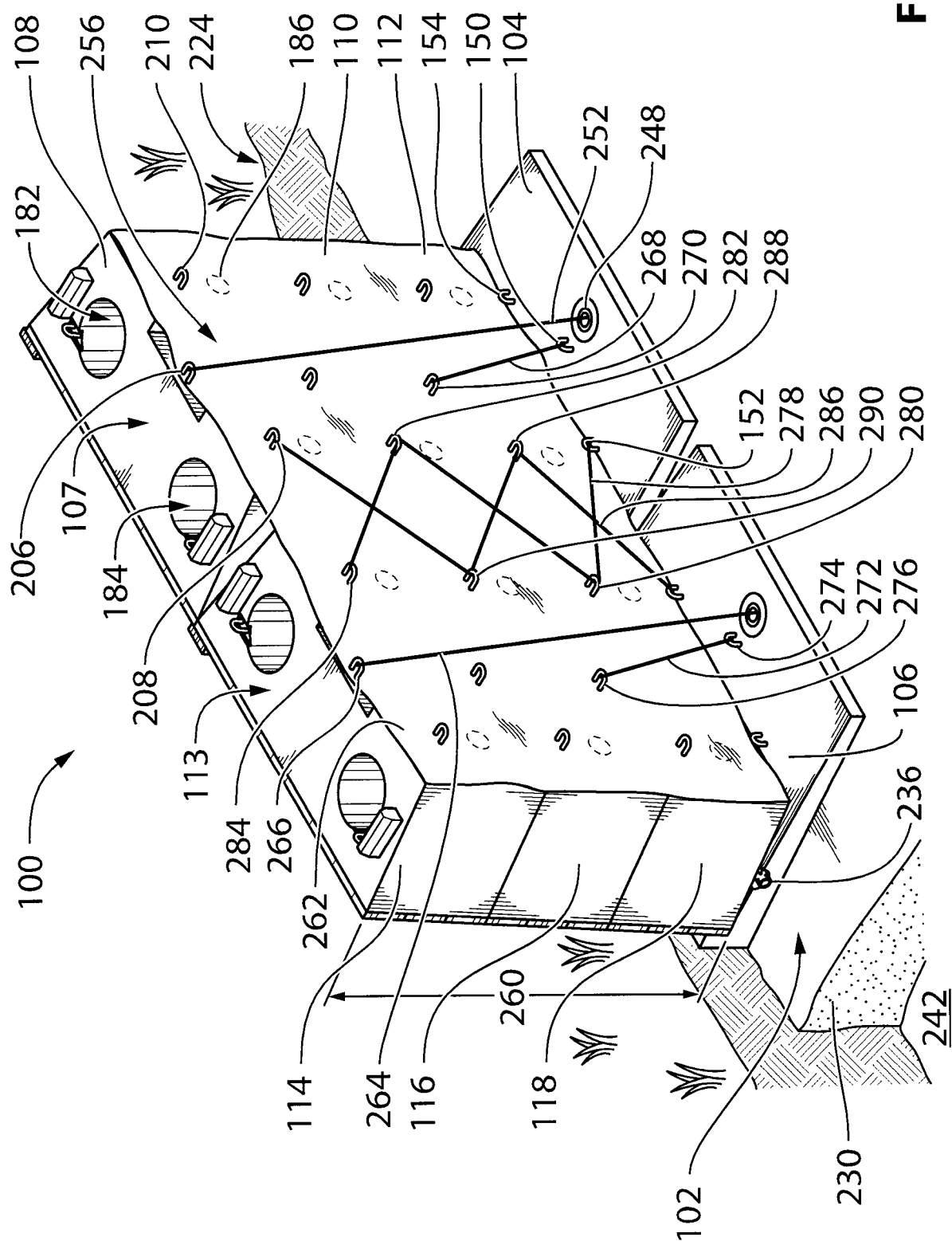


Fig. 9

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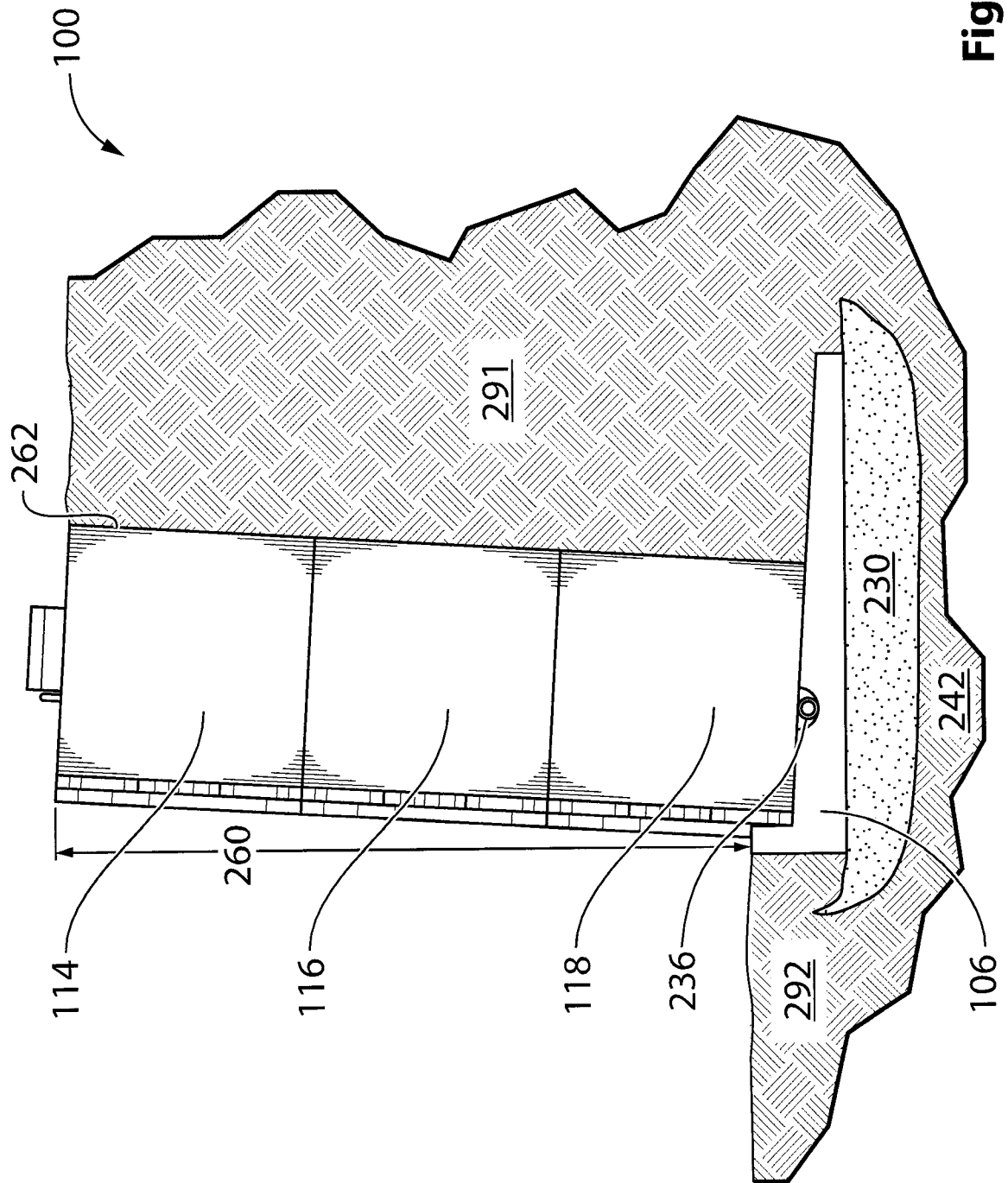


Fig.10

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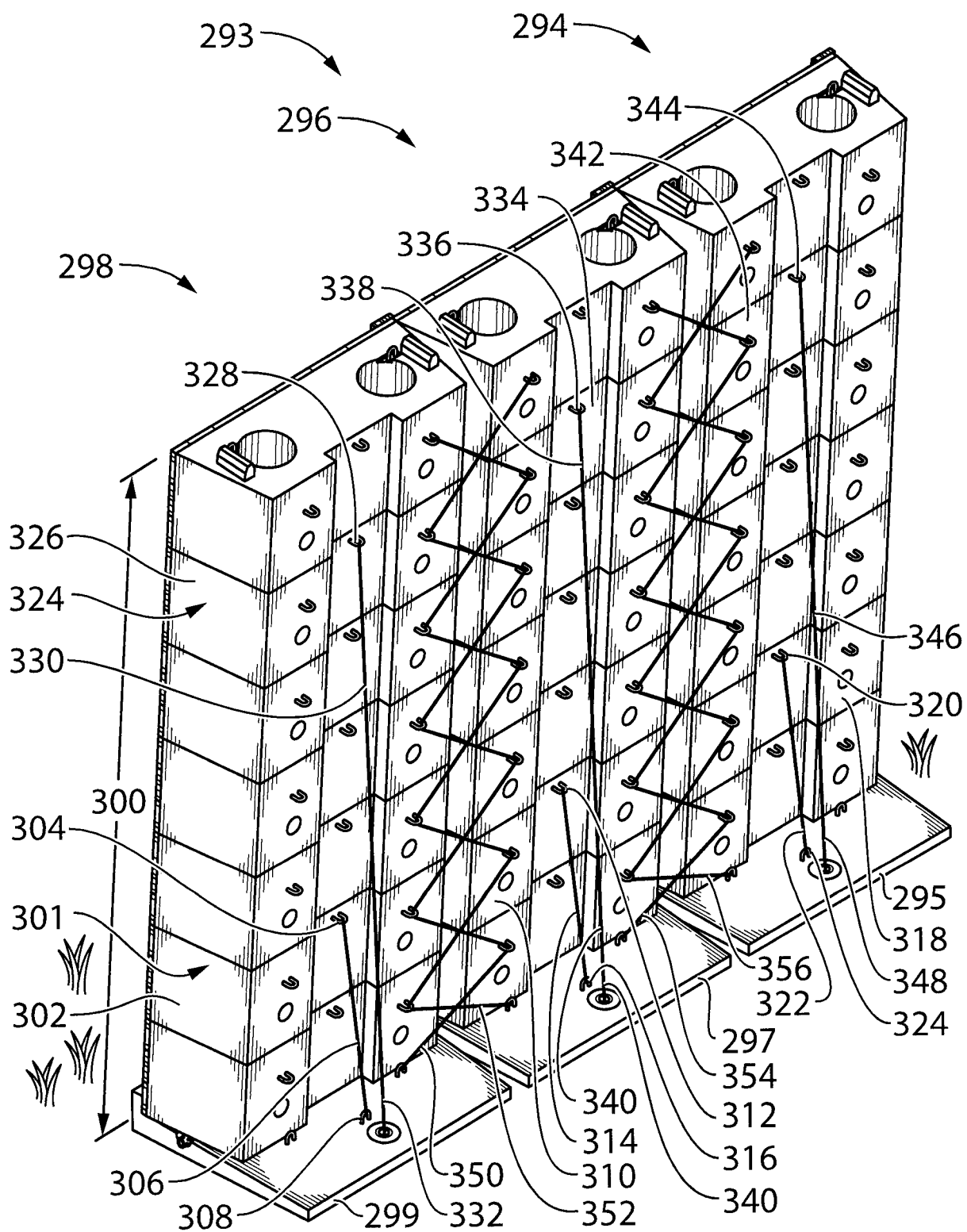


Fig. 11

