

Security Bulwark for Location at a Corner of a
Perimeter Railing of a Vessel or Marine Installation

5 The present invention concerns a security bulwark for protecting the perimeter of vessels, such as merchant and naval ships, and marine installations, such as oil rigs and other marine platforms, against unauthorized potential boarders, such as pirates, stowaways and activists. The present invention also concerns a perimeter protection system for a vessel or marine installation and a method of protecting a perimeter of a vessel or marine
10 installation.

With increased criminality at sea, there has been a corresponding increase in the need for sea-going vessels and marine installations to be protected against such unauthorized potential boarders. The unauthorized potential boarders may approach a ship or platform,
15 for example, in one or more smaller, high-speed boats equipped with a variety of ladders, climbing poles, grappling hooks and ropes. They may bring such a boat alongside the larger ship or platform, raise a ladder or climbing pole from the boat up the side of the larger ship or platform and attempt to board it by climbing the ladder or pole to gain access to a deck of the ship or platform. They may also attempt to throw a grappling hook attached to a
20 rope on to the deck in order to catch hold of an item fixed to the deck, thereby allowing them to scale the rope. This has led to the development of a number of different types of known security bulwark for protecting the perimeter of vessels and marine installations by aiming to thwart such unauthorized potential boarders. These known security bulwarks are typically mounted over a perimeter railing running along the edge of a deck of the vessel or
25 marine installation. Examples of these known types of security bulwark are described in JP 2001 191983 A, GB 2 496 757 A, CN 2014 72648 U, CN 2013 50963 Y, CN 2013 57935 Y and CN 2013 67101 Y.

In general, these known types of security bulwarks are arranged side-by-side adjacent to
30 each other along the perimeter railing at the edge of a deck of a vessel or marine installation to create a perimeter protection system for the vessel or marine installation, the system comprising a plurality of such security bulwarks. However, these known types of security

bulwark suffer from the disadvantage that they can generally only be mounted over a substantially straight run of perimeter railing. Thus, if two substantially straight runs of perimeter railing meet at a corner, for example where a first run of perimeter railing along a port or starboard side of a vessel meets a second run of perimeter railing along the stern of the vessel, or where two runs of perimeter railing along adjacent sides of an oil rig or other marine platform meet at a corner thereof, security bulwarks of a known type can only be mounted on each of the two substantially straight runs of perimeter railing as close as possible to the corner, but leaving the corner of the vessel or marine installation itself exposed. This creates a point of weakness in the protection of the vessel or marine installation at the corner, which can be exploited by unauthorized potential boarders to gain access to the vessel or marine installation on the principle of "a chain is only as strong as its weakest link".

The present invention aims to address this problem with the known types of security bulwark. It also aims to provide an improved type of security bulwark, an improved perimeter protection system for a vessel or marine installation, and an improved method of protecting a perimeter of a vessel or marine installation.

Accordingly, in a first aspect, the present invention provides a security bulwark for location at a corner of a perimeter railing of a vessel or marine installation. The security bulwark has a left side and a right side, which are oriented substantially perpendicular to each other. This allows the security bulwark to be located at a corner of a perimeter railing of a vessel or marine installation where a first substantially straight run of the railing meets a second substantially straight run of the railing, and for the left side of the security bulwark to be positioned alongside a first adjacent bulwark located close to the corner on the first run and the right side of the security bulwark to be positioned alongside a second adjacent bulwark located close to the corner on the second run. Thus the perimeter of the vessel or marine installation, including the corner thereof, can be protected against unauthorized potential boarders by positioning adjacent security bulwarks side-by-side adjacent to each other along the perimeter railing, including at the corner thereof.

Preferably, at least one of the left side and the right side of the security bulwark comprises a connection site for connecting the bulwark to an adjacent security bulwark. This has the advantage that even if the security bulwark cannot be mounted directly to the corner of the perimeter railing, for example because of the shape of the corner, it can still be located at the corner and securely mounted in that location by being connected to the adjacent security bulwark.

If so, the connection site preferably comprises a through-hole formed in the at least one of the left side and the right side of the bulwark. Thus a connector, such as a bolt, can be inserted through the through-hole parallel with a substantially straight run of the perimeter railing which meets at the corner, allowing the left or right side of the bulwark comprising the connection site to be quickly and easily connected to a side of an adjacent bulwark positioned on the straight run of perimeter railing.

Preferably, the bulwark has a front face comprising a projecting mound, wherein the mound has an underside providing the bulwark with an overhang and the mound is convex in a direction from the left side to the right side of the bulwark. By a front face of the bulwark is meant a face of the bulwark which, if the security bulwark is located at a corner of the perimeter railing, faces out to sea. The front face of the security bulwark may therefore also be considered as that face of the bulwark which is intended to be seaward facing when the bulwark is in use on a vessel or marine installation.

Providing the security bulwark with a front face as just described has several advantages as follows. Firstly, if the bulwark is located at the corner, the projecting mound presents a significant obstacle to an unauthorized potential boarder attempting to approach the corner of the vessel or marine installation. The overhang provided by the underside of the mound makes it extremely difficult for such a potential boarder to climb up the side of the vessel or marine installation and over the security bulwark in order to gain access to the deck. Furthermore, because the mound is convex in a direction from the left side to the right side of the bulwark, if an unauthorized potential boarder attempts to lean a ladder or climbing pole against the bulwark, the ladder or climbing pole will tend to slide to one side of the mound rather than being able to lean against it. The convexity of the mound in a direction

from the left side to the right side of the bulwark also tends to cause a ladder to twist as it slides. In other words, the convexity of the mound in a direction from the left side to the right side of the bulwark presents an uneven surface which it is extremely difficult to lean something against, especially from a boat being moved about by waves and swell. Finally, if the bulwark has a front face as described, the underside of the mound and the overhang which it provides to the bulwark make the bulwark convex in a direction of its height. However, because the mound is also convex in a direction from the left side to the right side of the bulwark, the mound is therefore convex in two different directions. This combination of convexities gives the bulwark improved strength and rigidity in comparison to a bulwark which is only convex in a direction of its height and a better strength-to-weight ratio than such a bulwark.

Preferably, the bulwark has a rear opposite to the front face, the rear comprising a recess to receive the corner of the perimeter railing. By a rear of the security bulwark is therefore meant a part of the bulwark which, if the bulwark is located at a corner of the perimeter railing, faces in towards a deck of the vessel or marine installation. The rear of the security bulwark may otherwise be considered to be that part of the security bulwark which is intended to be deck-facing when the bulwark is in use on a vessel or marine installation. If the rear of the bulwark comprises such a recess to receive the corner of the perimeter railing, this allows the bulwark to be quickly and easily located outside and across the corner of the railing and for the corner of the railing to be hidden within the recess out of sight from unauthorized potential boarders.

If the security bulwark has a rear comprising such a recess and a front face comprising such a projecting mound, the recess is preferably formed by an interior surface of the mound. This allows the bulwark to be made of a single layer of material, for example by being rotation moulded, which gives the bulwark a good strength-to-weight ratio, making it light and easy to handle.

If so, it is also preferable that the recess is able to receive the mound on the front face of a similar bulwark, whereby the bulwarks can be nested together. This has the advantage of

allowing several such bulwarks to be nested together and stacked on a pallet for rapid and easy transportation.

Preferably, the security bulwark has a height of between 500 mm and 1000 mm. More preferably still, it has a height of between 500 mm and 750 mm. The regulation height of a ship's railing is at least 1 metre from a deck on which the railing is mounted. Known types of security bulwarks for ship's railings are generally more than a metre in height, so that the railing is completely covered by such a known type of bulwark, which may also extend further down the outside of the ship. However, this has the disadvantage that in high seas, if waves break on to the deck, seawater from such waves can be contained on the deck by the bulwark and prevented from washing back over the edge of the ship into the sea. Seawater thus contained on the deck may slosh around on the deck, which can affect the ship's stability, a problem generally known in the art as "free surface effect". On the other hand, regulations also require that an opening between the lowest course of rails in a ship's railing and the deck shall not exceed 230 mm. Thus if the bulwark has a height of between about 500 mm and about 1000 mm, and more preferably between about 500 mm and about 750 mm, this ensures that all of the openings between the courses of rails in a railing to which the bulwark is mounted, from the lowest course of rails to the topmost handrail, are at least partially covered by the bulwark, whilst still leaving a gap between a lowermost edge of the bulwark and the deck to allow seawater from waves which break on to the deck to wash back over the edge of the ship into the sea. Such a gap does not compromise the security which the bulwark provides for two reasons, however, as follows. Firstly, the deck of a ship is also provided with a vertical lip at its edge called a fishplate, which on some vessels, hides the gap between the lowest course of rails and the deck from unauthorized potential boarders. Secondly, since the lowest course of rails in the ship's railing is no more than 230 mm above the deck, an unauthorized potential boarder is unable to squeeze through the gap between the lowermost edge of the bulwark and the deck because this is obstructed by the lowest course of rails.

Preferably, the bulwark has a breadth of between 350 mm and 700 mm. A breadth of more than about 350 mm is found to be sufficiently large to cover a corner of a perimeter railing of any thickness generally found on a vessel or marine installation. On the other hand, a

breadth of less than about 700 mm is found to be sufficiently small for one person to be able to handle the bulwark with ease in order to locate it at the corner.

In a second aspect, the present invention also provides a perimeter protection system for a vessel or marine installation, the system comprising a plurality of security bulwarks arranged side-by-side adjacent to each other, wherein the plurality of security bulwarks includes a security bulwark according to the first aspect of the invention. In contrast to a known perimeter protection system for a vessel or marine installation, which also comprises a plurality of security bulwarks arranged side-by-side adjacent to each other, such a perimeter protection system does not have a point of weakness at the corner of the vessel or marine installation which can be exploited by unauthorized potential boarders to gain access to the vessel or marine installation.

In such a perimeter protection system, the plurality of security bulwarks preferably further comprises a first longitudinal security bulwark positioned along a first run of the perimeter railing, a second longitudinal security bulwark positioned along a second run of the perimeter railing which is substantially perpendicular to the first run and meets the first run at the corner, wherein the security bulwark according to the first aspect of the invention is located at the corner with its left side connected to the first longitudinal security bulwark and its right side connected to the second longitudinal security bulwark. By a longitudinal security bulwark is meant a security bulwark which can be positioned along a substantially straight run of perimeter railing. With such an arrangement, a security bulwark according to the invention can be located at said corner even if it cannot be mounted directly to the corner of the perimeter railing, for example because of the shape of the corner.

Preferably, in a perimeter protection system according to the second aspect of the invention, adjacent ones of the plurality of security bulwarks abut each other. This ensures that the plurality of security bulwarks presents a continuous obstruction to unauthorized potential boarders without any gaps between the bulwarks which can be exploited by them to gain access to a deck of the vessel or marine installation.

In a third aspect, the present invention also provides a method of protecting a perimeter of a vessel or marine installation, the method comprising arranging a plurality of security bulwarks side-by-side adjacent to each other along a perimeter railing of the vessel or marine installation, wherein the perimeter railing comprises a corner, providing a security bulwark according to the first aspect of the invention as one of the plurality of security bulwarks, and locating said bulwark at the corner. Locating a security bulwark according to the first aspect of the invention at the corner in this manner provides greater security against unauthorized potential boarders in comparison to known methods of protecting a perimeter of a vessel or marine installation which leave the corner exposed.

Preferably, the method further comprises positioning a first longitudinal security bulwark along a first run of the perimeter railing, positioning a second longitudinal security bulwark along a second run of the perimeter railing, the second run being substantially perpendicular to the first run and meeting the first run at the corner, and connecting the left side of the security bulwark according to the first aspect of the invention to the first longitudinal security bulwark and the right side thereof to the second longitudinal security bulwark. Such a method allows a security bulwark according to the invention to be located at the corner even if it cannot be mounted directly to the corner of the perimeter railing, for example because of the shape of the corner.

Preferably, the method further comprises abutting adjacent ones of the plurality of security bulwarks against each other. This ensures that the plurality of security bulwarks presents a continuous obstruction to unauthorized potential boarders without gaps between the bulwarks which could be exploited by them to gain access to a deck of the vessel or marine installation.

Further features and advantages of the present invention will become apparent from the following detailed description, which is given by way of example and in association with the accompanying drawings, in which:

Fig. 1 is a perspective view from an outside or seaward side of a part of a perimeter railing at a corner of a vessel or marine installation;

Fig. 2 is a perspective view from an inside or deck side of the part of the perimeter railing shown in Fig. 1;

- 5 Fig. 3 is a perspective view from the outside or seaward side of two longitudinal security bulwarks mounted on the part of the perimeter railing shown in Figs. 1 and 2;

Fig. 4 is a perspective view from the inside or deck side of the same two longitudinal security bulwarks as shown in Fig. 3 mounted on the part of the perimeter railing shown in Figs. 1
10 and 2;

Fig. 5 is a perspective view from behind and above of an embodiment of a security bulwark for location at a corner of a perimeter railing of a vessel or marine installation;

- 15 Fig. 6 is a perspective view of a rear of the security bulwark shown in Fig. 5;

Fig. 7 is a perspective view of a front face of the security bulwark shown in Fig. 5;

Fig. 8 is a perspective view from in front and below of the security bulwark shown in Fig. 5;
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Fig. 9 is a perspective view from the outside or seaward side of the security bulwark shown in Figs. 5 to 8 located at the corner of the perimeter railing shown in Figs. 1 and 2;

Fig. 10 is a perspective view from the inside or deck side of the security bulwark shown in
25 Figs. 5 to 8 located at the corner of the perimeter railing shown in Figs. 1 and 2;

Fig. 11 is a perspective view from the outside or seaward side of a part of an embodiment of a perimeter protection system located at the corner of the perimeter railing shown in Figs. 1
and 2; and

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Fig. 12 is a perspective view from the inside or deck side of the part of the perimeter protection system shown in Fig. 11.

Figs. 1 and 2 respectively show views from an outside or seaward side and from an inside or deck side of a part of a perimeter railing 20 located at a corner 21 of a vessel or marine installation. Part of a side of the vessel or marine installation can be seen in Fig. 2 labelled with reference numeral 52. The railing 20 comprises a first run 210 and a second run 220 of railing, which are substantially perpendicular to each other and meet at the corner 21. The perimeter railing 20 comprises a plurality of courses of rails, which include a topmost handrail 201, a middle course of rails 202 and a lowest course of rails 203. At regular intervals along the perimeter railing 20 are a plurality of vertical stanchions 204. Regulations require that the vertical stanchions 204 are spaced no more than 1.5 metres apart. The perimeter railing 20 is mounted on a deck 51 of the vessel or marine installation. The overall height, g , of the railing 20 from the deck 51 to the topmost handrail 201 is required by regulations to be at least 1 metre. The separation, f , of the lowest course of rails 203 from the deck 51 is also required by regulations to be no more than 230 mm. The middle course of rails 202 is positioned approximately equidistant between the topmost handrail 201 and the lowest course of rails 203. Thus a gap between the topmost handrail 201 and the middle course of rails 202 or between the middle course of rails 202 and the lowest course of rails 203 is given by $(g - f)/2$, from which must also be subtracted the thickness of the courses of rails themselves. Each gap is therefore usually not more than 500 mm in height, and, in practice, is considerably less than this. Outside the railing 20 at the edge of the deck 51 is a vertical lip called a fishplate 53, the height of which depends upon the type of vessel or marine installation on which the railing 20 is mounted, but which, in general, is between about 90 and about 400 mm in height.

Figs. 3 and 4 respectively show views from the outside or seaward side and from the inside or deck side of the same perimeter railing 20 as is shown in Figs. 1 and 2, on which two longitudinal security bulwarks 1a, 1b have been mounted. One of the longitudinal security bulwarks 1a is mounted on the first run 210 of the perimeter railing 20 and the other longitudinal security bulwark 1b is mounted on the second run 220 of the railing 20. As can be seen from Figs. 3 and 4, because they are designed to be positioned along substantially straight runs of perimeter railing, neither of the longitudinal security bulwarks 1a, 1b can be mounted across the corner 21 of the railing 20. They can only be mounted on the first and

second runs 210, 220 of the railing 20 as close to the corner 21 as the shape of the corner 21 will allow. In the case of the railing 20 shown in Figs. 1 to 4, this is almost close enough to allow the two longitudinal security bulwarks 1a, 1b to touch each other, but not close enough for them to cover the corner 21, thus leaving the corner 21 exposed. Each of the two longitudinal security bulwarks 1a, 1b comprises a respective side face 16a, 16b oriented substantially perpendicular to the run 210, 220 of the railing 20 on which the respective one of the two longitudinal security bulwarks 1a, 1b is mounted. The side faces 16a, 16b both comprise a plurality of connection sites 17 for connecting the respective bulwark 1a, 1b to an adjacent security bulwark. However, the perpendicular orientation of the two bulwarks 1a, 1b prevents them from being positioned with their respective side faces 16a, 16b parallel to and abutting each other, which therefore also prevents them from being connected to each other at the corner 21 via their respective connection sites 17.

Figs. 5 to 8 show different views of an embodiment of a security bulwark 30 suitable for location at a corner of a perimeter railing of a vessel or marine installation. The security bulwark 30 has a left side 31L and a right side 31R which are oriented substantially perpendicular to each other. Each of the left side 31L and the right side 31R comprises a plurality of connection sites 37 for connecting the security bulwark 30 to an adjacent security bulwark. The connection sites 37 each comprise a through-hole formed in the respective one of the left side 31L and the right side 31R of the bulwark 30. The bulwark 30 has a front face 32 comprising a projecting mound 33. The mound 33 has an underside 34, which provides the bulwark with an overhang, and is convex in a direction from the left side 31L to the right side 31R of the bulwark 30. The bulwark 30 has a rear 35 opposite to the front face 32. The rear 35 comprises a recess 36 to receive the corner 21 of the perimeter railing 20. The recess 36 is formed by an interior surface 38 of the projecting mound 33. The mound 33 further comprises a raised crest 39 adapting the recess 36 to receive the corner 21 of the perimeter railing 20. The recess 36 is also able to receive the mound 33 on the front face 32 of a similar bulwark 30, whereby two or more such bulwarks can be nested together.

The security bulwark 30 has a height, h , of between 500 mm and 1000 mm. Thus all of the gaps between the courses of rails in a railing to which the bulwark 30 is mounted, from the

lowest course of rails to the topmost handrail, are at least partially covered by the bulwark 30, whilst still leaving an opening between a lowermost edge of the bulwark and the deck, to allow seawater from waves which break on to the deck to wash back over the edge of the ship into the sea. The security bulwark 30 also has a breadth, b , of between 350 mm and 700 mm. Thus the bulwark 30 is able to cover a corner of a perimeter railing of any thickness generally found on a vessel or marine installation, whilst also being sufficiently small for one person to be able to handle the bulwark with ease in order to locate it at the corner.

Figs. 9 and 10 respectively show views from the outside or seaward side and from the inside or deck side of the security bulwark 30 located at the corner 21 of the perimeter railing 20 shown in Figs. 1 and 2. As may be seen, the corners of the topmost handrail 201 and of the middle course of rails 202 are both received in the recess 36 on the rear 35 of the bulwark 30. The bulwark 30 thus completely covers the gap between the topmost handrail 201 and the middle course of rails 202, and partially covers the gap between the middle course of rails 202 and the lowest course of rails 203, whereas the gap between the lowest course of rails 203 and the deck is substantially hidden behind the fishplate 53.

Figs. 11 and 12 respectively show views from the outside or seaward side and from the inside or deck side of a part of an embodiment of a perimeter protection system 300 in the region of the corner 21 of the perimeter railing 20 shown in Figs. 1 and 2. The perimeter protection system 300 comprises a plurality of security bulwarks 1a, 1b, 30 arranged side-by-side adjacent to each other, which continue along the perimeter railing 20 beyond the part of the perimeter protection system 300 at the corner 21, which is shown in Figs. 11 and 12. The plurality of security bulwarks comprises the two longitudinal security bulwarks 1a, 1b shown in Figs. 3 and 4 and the security bulwark 30 shown in Figs. 5 to 8. The first longitudinal security bulwark 1a is positioned along the first run 210 of the perimeter railing 20 and the second longitudinal security bulwark 1b is positioned along the second run 220 of the perimeter railing 20. The security bulwark 30 is located at the corner 21 of the perimeter railing 20. Thus the security bulwark 30 is located between and adjacent to each of the two longitudinal security bulwarks 1a, 1b.

Since the left side 31L and the right side 31R of the security bulwark 30 are oriented substantially perpendicular to each other, each of the left and right sides 31L, 31R can be aligned parallel with a respective one of the side faces 16a, 16b of the longitudinal security bulwarks 1a, 1b. Thus the left side 31L of the security bulwark 30 can be connected to the side face 16a of the first longitudinal security bulwark 1a and the right side 31R of the security bulwark 30 can be connected to the side face 16b of the second longitudinal security bulwark 1b. These connections are made by aligning the connection sites 37 on the left and right sides 31L, 31R of the bulwark 30 with corresponding ones of the connection sites 17 on the respective side faces 16a, 16b of the longitudinal security bulwarks 1a, 1b. The connection sites 17 each comprise a through-hole formed in the respective ones of the side faces 16a, 16b of the longitudinal security bulwarks 1a, 1b. Thus a connector, such as a bolt, can be inserted through an aligned pair of corresponding through-holes 17, 37 parallel with a respective one of the runs 210, 220 of the perimeter railing 20. The bolt can then be fitted with a nut, for example, and both can be tightened together until adjacent ones of the plurality of security bulwarks 1a, 1b, 30 abut each other. In this manner, the plurality of security bulwarks 1a, 1b, 30 presents a continuous obstruction to unauthorized potential boarders without any gaps between them which could otherwise be exploited by the potential boarders to gain access to the deck 51 of the vessel or marine installation in the region of the corner 21.

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Claims

1. A security bulwark (30) for location at a corner (21) of a perimeter railing (20) of a vessel or marine installation, the security bulwark having a left side (31L) and a right side (31R) which are oriented substantially perpendicular to each other.

2. A security bulwark according to claim 1, wherein at least one of the left side (31L) and the right side (31R) comprises a connection site (37) for connecting the security bulwark (30) to an adjacent security bulwark (1a, 1b, 30).

3. A security bulwark according to claim 2, wherein the connection site (37) comprises a through-hole formed in the at least one of the left side (31L) and the right side (31R) of the bulwark (30).

4. A security bulwark according to any one of the preceding claims, wherein the bulwark (30) has a front face (32) comprising a projecting mound (33), wherein the mound has an underside (34) providing the bulwark with an overhang and the mound is convex in a direction from the left side (31L) to the right side (31R) of the bulwark (30).

5. A security bulwark according to claim 4, wherein the bulwark (30) has a rear (35) opposite to the front face (32), the rear (35) comprising a recess (36) to receive the corner (21) of the perimeter railing (20).

6. A security bulwark according to claim 5 when dependent on claim 4, wherein the recess (36) is formed by an interior surface (38) of the projecting mound (33).

7. A security bulwark according to claim 5 when dependent on claim 4 or according to claim 6, wherein the recess (36) is able to receive the mound (33) on the front face (32) of a similar bulwark (30), whereby the bulwarks can be nested together.

8. A security bulwark according to any one of the preceding claims, wherein the bulwark has a height (h) of between 500 mm and 1000 mm.

9. A security bulwark according to any one of the preceding claims, wherein the bulwark has a breadth (b) of between 350 mm and 700 mm.

5 10. A perimeter protection system (300) comprising a plurality of security bulwarks (1a, 1b, 30) arranged side-by-side adjacent to each other, wherein the plurality of security bulwarks includes a security bulwark (30) according to any one of claims 1 to 9.

11. A perimeter protection system according to claim 10, wherein the plurality of
10 security bulwarks (1a, 1b, 30) further comprises:

a first longitudinal security bulwark (1a) positioned along a first run (210) of the perimeter railing (20);

a second longitudinal security bulwark (1b) positioned along a second run (220) of the perimeter railing (20) which is substantially perpendicular to the first run (210) and
15 meets the first run (210) at said corner (21); and wherein

the security bulwark (30) according to any one of claims 1 to 9 is located at the corner (21) with its left side (31L) connected to the first longitudinal security bulwark (1a) and its right side (31R) connected to the second longitudinal security bulwark (1b).

20 12. A perimeter protection system according to claim 10 or claim 11, wherein adjacent ones of the plurality of security bulwarks (1a, 1b, 30) abut each other.

13. A method of protecting a perimeter of a vessel or marine installation, the method comprising:

25 arranging a plurality of security bulwarks (1a, 1b, 30) side-by-side adjacent to each other along a perimeter railing (20) of the vessel or marine installation, wherein the perimeter railing (20) comprises a corner (21);

providing a security bulwark (30) according to any one of claims 1 to 9 as one of the plurality of security bulwarks (1a, 1b, 30); and

30 locating said bulwark (30) at said corner (21).

14. A method according to claim 13, further comprising:

positioning a first longitudinal security bulwark (1a) along a first run (210) of the perimeter railing (20);

positioning a second longitudinal security bulwark (1b) along a second run (220) of the perimeter railing (20), the second run (220) being substantially perpendicular to the first run (210) and meeting the first run (210) at the corner (21); and

connecting the left side (31L) of the security bulwark (30) according to any one of claims 1 to 9 to the first longitudinal security bulwark (1a) and the right side (31R) thereof to the second longitudinal security bulwark (1b).

10 15. A method according to claim 13 or claim 14, further comprising abutting adjacent ones of the plurality of security bulwarks (1a, 1b, 30) against each other.

Abstract

In one aspect, the present invention provides a security bulwark (30) for location at a corner (21) of a perimeter railing (20) of a vessel or marine installation. The security bulwark has a left side (31L) and a right side (31R) which are oriented substantially perpendicular to each other. The invention also provides a perimeter protection system (300) comprising a plurality of security bulwarks (1a, 1b, 30) arranged side-by-side adjacent to each other, wherein the plurality of security bulwarks includes such a security bulwark (30). Finally, the invention further provides a method of protecting a perimeter of a vessel or marine installation. The method comprises arranging a plurality of security bulwarks (1a, 1b, 30) side-by-side adjacent to each other along a perimeter railing (20) of the vessel or marine installation, wherein the perimeter railing (20) comprises a corner (21). According to the method, such a security bulwark (30) as just described is provided as one of the plurality of security bulwarks (1a, 1b, 30) and is located at said corner (21). Thus the plurality of security bulwarks (1a, 1b, 30) presents a continuous obstruction to unauthorized potential boarders, including at the corner (21), without any gaps between them which might otherwise be exploited to gain access to a deck of the vessel or marine installation.

[Fig. 11]