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(54) **OBSTRUCTION FOR MOUNTING ALONG A PERIMETER, PERIMETER PROTECTION SYSTEM, VESSEL OR MARINE INSTALLATION, AND METHOD OF PROTECTING A PERIMETER**

SPERRE ZUR MONTAGE ENTLANG EINER EINGRENZUNG, EINGRENZUNGSSCHUTZSYSTEM, SCHIFF- ODER MEERESINSTALLATION UND VERFAHREN ZUM SCHUTZ EINER EINGRENZUNG

OBSTRUCTION POUR MONTER LE LONG D'UN PÉRIMÈTRE, SYSTÈME DE PROTECTION DE PÉRIMÈTRE, VAISSEAU OU INSTALLATION MARINE ET PROCÉDÉ DE PROTECTION D'UN PÉRIMÈTRE

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Description

[0001] The present invention concerns an obstruction for mounting along a perimeter of a vessel, such as a merchant or naval ship, or marine installation, such as an oil rig or other marine platform. The present invention also concerns a system for protecting the perimeter of a vessel or marine installation against unauthorized potential boarders, such as pirates, stowaways and activists, as well as a vessel or marine installation comprising such a system, and a method of protecting the perimeter of a vessel or marine installation.

[0002] 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, 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 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 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 marine installation.

[0003] On the other hand, many vessels and marine installations further comprise an upstanding plate running along the edge of the deck. Such a plate, which is commonly called a fishplate, is designed to prevent objects on the deck from sliding off the edge of the deck and falling overboard, if the deck departs from horizontal due to motion of the vessel or marine installation or if the deck is washed by waves or buffeted by adverse weather.

[0004] CN 202935562 U describes a defensive device which can be hung over a fishplate on an outboard or seaward side of a vessel, in order to deter unauthorized potential boarders.

[0005] However, the top edge of the fishplate can provide a location for an unauthorized potential boarder to attach a hook or to gain a handhold in an attempt to board the vessel or marine installation. The fishplate can also interfere with the mounting of security bulwarks along the perimeter railing. This is especially true if the security bulwarks extend substantially the whole height of the perimeter railing or beyond the edge of the deck in a seaward direction at a location near to or below the bottom edge of the railing. Very little consideration seems to have been given in the prior art to the solution of these problems.

[0006] The present invention aims to address these and other problems. It also aims to provide an obstruction for mounting along a perimeter of a vessel, a perimeter protection system for a vessel or marine installation comprising a plurality of such obstructions, a vessel or marine installation comprising a plurality of such obstructions, and a method of protecting a perimeter of a vessel or marine installation using a plurality of such obstructions.

[0007] Accordingly, in a first aspect, the present invention provides an obstruction for mounting along a perimeter of a vessel or marine installation, wherein the vessel or marine installation comprises a deck having a perimeter railing and an upstanding plate along an edge of the deck. The obstruction has an elongate body comprising a longitudinal groove for receiving a lowermost course of rails of the perimeter railing, and a tongue for overhanging the plate on an outboard or seaward side thereof. The tongue comprises a rear surface intended to face in an inboard direction when the obstruction is mounted along the perimeter of the vessel or marine installation. A separation, s , between the rear surface of the tongue and a centreline of the longitudinal groove is between 30 and 300 mm, and the centreline of the longitudinal groove and the separation, s , together define a plane which subtends an angle, θ , of between 90 and 135 degrees to the rear surface of the tongue.

[0008] With such an obstruction, the fishplate can be protected from unauthorized potential boarders trying to attach a hook to the fishplate or to gain a handhold on the top edge of the fishplate. The combination of features of the separation, s , and the angle, θ , of the obstruction as described above allows the obstruction to protect a wide variety of different possible heights of fishplate and different possible distances of the perimeter railing across the deck to the fishplate, in a manner to be described in greater detail below.

[0009] Moreover, with the use of such a fishplate protector as this obstruction provides, a plurality of security bulwarks may be mounted along the perimeter railing above a plurality of such obstructions to provide the vessel or marine installation with a perimeter protection system, without the need to employ security bulwarks which extend substantially the whole height of the perimeter railing or beyond the edge of the deck in a seaward direction at a location near to or below the bottom edge of the railing. For example, security bulwarks which extend approximately only two-thirds or three-quarters of the height of the perimeter railing from the top thereof may be used instead. Thus the risk of the fishplate interfering with the mounting of security bulwarks along the perimeter railing can be avoided.

[0010] Preferably, the tongue of the obstruction has a thickness, t , which tapers in a direction away from the longitudinal groove. This helps to maintain the orientation of the obstruction with the tongue in a downwardly pointing direction when the obstruction is in use. It also has the advantage of shifting the centre of mass of the obstruction in a more inboard direction when the obstruction

is in use, which reduces the chance of the obstruction being accidentally lost overboard in adverse weather or sea conditions.

[0011] Preferably, the longitudinal groove is adapted for rotation of the obstruction about the lowermost course of rails, so that the obstruction can accommodate plates of different heights along the edge of the deck.

[0012] Preferably, the obstruction further comprises an upper surface intended to face upwards when the obstruction is mounted along the perimeter of the vessel or marine installation, wherein the upper surface is convexly curved in a direction of the depth of the obstruction. This has the advantage of ensuring that the upper surface maintains a substantially constant height above the deck if the obstruction is rotated to suit different heights of fishplate, thereby making it less likely to interfere with any security bulwark mounted above it on the perimeter railing. It also helps to prevent the upper surface of the obstruction from being used by an unauthorized potential boarder as a location for a handhold.

[0013] If so, the upper surface is preferably also substantially smooth. This makes it harder for the upper surface of the obstruction to be used by an unauthorized potential boarder as a location for a handhold.

[0014] It is also preferred for the tongue to comprise a front surface intended to face in a seaward direction when the obstruction is mounted along the perimeter of the vessel or marine installation, which front surface is substantially smooth. This makes it harder for an unauthorized potential boarder to gain a hand or foothold on the front surface.

[0015] Preferably, the obstruction further comprises an attachment facility proximate the longitudinal groove for attaching the obstruction to the lowermost course of rails. This allows the obstruction to be securely fastened to the perimeter railing, even though the obstruction cannot be readily attached to the fishplate.

[0016] If so, the attachment facility preferably comprises one or more through-holes in the obstruction. This has the advantage of allowing the obstruction to be attached to the perimeter railing quickly and easily by tying.

[0017] Preferably, the obstruction further comprises an anti-rotation device for impeding rotation of the obstruction about the lowermost course of rails. This has the advantage of preventing an unauthorized potential boarder from being able to flip the tongue of the obstruction up, in order to try and gain access to the top edge of the fishplate and use it as a handhold, for example.

[0018] If so, the anti-rotation device preferably comprises one or more through-holes in the tongue. This allows the obstruction to be tied to another, adjacent, similar obstruction or to one or more vertical stanchions or support stays of the perimeter railing, for example.

[0019] The obstruction preferably has a width, w , of between 0.70 and 1.50 metres, more preferably of between 0.80 and 1.40 metres, and most preferably of between 0.90 and 1.30 metres. Such a width has the advantage of being best suited to fit in the spaces between

adjacent vertical stanchions of perimeter railings which are commonly encountered.

[0020] Preferably, the tongue has a height, h , of between 200 and 600 mm, more preferably of between 250 and 500 mm, and most preferably of between 300 and 400 mm. Such a height has the advantage of being best suited to the different possible distances of the perimeter railing from the fishplate, across the deck, which are commonly encountered.

[0021] Preferably, the obstruction is constituted of one or more materials which are resistant to weather and seawater, such as inert plastics materials. For example, the obstruction may be made of high density polyethylene (HDPE) and/or of glass reinforced nylon, both of which also have good strength and rigidity.

[0022] In a second aspect, the present invention also provides a perimeter protection system comprising a plurality of obstructions according to the first aspect of the invention, and a plurality of security bulwarks for mounting to the perimeter railing of the vessel or marine installation, above the obstructions. The security bulwarks may, for example, be of a type shown and described in UK patent no. GB 2 531 232 B, also in the name of the present applicant and the contents of which are incorporated herein by reference.

[0023] In a third aspect, the present invention further provides a vessel or marine installation comprising a plurality of obstructions according to the first aspect of the invention arranged side-by-side and adjacent to each other along the perimeter of the vessel or marine installation, and a plurality of security bulwarks arranged side-by-side and adjacent to each other along the perimeter railing of the vessel or marine installation, above the obstructions. Thus the perimeter of the vessel or marine installation can be protected by a plurality of such obstructions and a plurality of such security bulwarks working together with each other to protect both the perimeter railing and the fishplate against unauthorized potential boarders.

[0024] The vessel or marine installation may comprise cargo protected by the plurality of obstructions and the plurality of security bulwarks.

[0025] In a fourth aspect, the present invention also provides a method of protecting a perimeter of a vessel or marine installation, wherein the vessel or marine installation comprises a deck having a perimeter railing and an upstanding plate along an edge of the deck. The method comprises positioning a plurality of obstructions according to the first aspect of the invention side-by-side and adjacent to each other along the perimeter of the vessel or marine installation, receiving a lowermost course of rails of the perimeter railing in the longitudinal grooves of the obstructions, and hanging the tongues of the obstructions over the plate on an outboard or seaward side thereof.

[0026] Preferably, the method further comprises attaching at least one of the obstructions to the perimeter railing. This is preferred because it is easiest. However,

in alternative possible embodiments, the obstructions may instead be attached to other items on the vessel or marine installation, such as to an obstacle permanently located on the deck, like a cleat or bitt.

[0027] In a preferred embodiment, the method also comprises impeding rotation of at least one of the obstructions about the lowermost course of rails. This is advantageous because it helps to prevent the obstruction from being flipped up to expose the top edge of the fishplate.

[0028] Preferably, the method further comprises positioning a plurality of security bulwarks side-by-side and adjacent to each other along the perimeter railing of the vessel or marine installation, above the obstructions. This is advantageous because both the fishplate and the railing can then be protected against unauthorized potential boarders.

[0029] 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 of a vessel or marine installation;

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

Fig. 3 is a first perspective view of an embodiment of an obstruction;

Fig. 4 is a second perspective view of the obstruction shown in Fig. 3;

Fig. 5 is a side profile view of the obstruction shown in Figs. 3 and 4;

Fig. 6 is a perspective view from an outside or seaward side of an embodiment of a perimeter protection system; and

Fig. 7 is a perspective view from an inside or deck side of the perimeter protection system shown in Fig. 6.

[0030] Figs. 1 and 2 respectively show views from an outside or seaward side and from an inside or deck side of a representative part of a perimeter railing 20 of a vessel or marine installation. Part of a side of the vessel or marine installation can be seen labelled with reference numeral 52. 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 mount-

ed 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.

[0031] 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. A distance across the deck 51 of the perimeter railing 20 from the fishplate 53 is not defined by regulations and may therefore also vary depending upon the type of vessel or marine installation on which the railing 20 is mounted. Typically, however, this distance across the deck 51 is up to about 300 mm.

[0032] The perimeter railing 20 is upheld at regular intervals by a plurality of support stays 205, one of which may be seen in Fig. 2. Regulations require that there must be a minimum of one support stay 205 for every three vertical stanchions 204, although it is common for there to be a support stay 205 for every other stanchion 204. Also shown in Fig. 2 is a representative example of an obstacle 23 permanently located on the inside or deck side of the railing 20. Such obstacles include accommodation ladders, cleats and bitts.

[0033] Figs. 3, 4 and 5 show an embodiment of an obstruction 10 suitable for mounting along a perimeter of a vessel or marine installation, when the vessel or marine installation comprises a deck 51 having a perimeter railing 20 and an upstanding plate 53 along an edge of the deck, such as are shown in Figs. 1 and 2. The obstruction 10 has an elongate body which comprises a longitudinal groove 12 for receiving the lowermost course of rails 203 of the perimeter railing 20, and a tongue 14 for overhanging the plate 53 on an outboard or seaward side of the plate. The tongue 14 comprises a rear surface 142 and a front surface 144. The rear surface 142 is intended to face in an inboard direction of the vessel or marine installation when the obstruction 10 is mounted along its perimeter, and the front surface is intended to face in an outboard or seaward direction. The obstruction 10 also comprises an upper surface 16 intended to face upwards when the obstruction 10 is mounted along the perimeter of the vessel or marine installation and an underside 18, which is opposite thereto and in which the longitudinal groove 12 is formed. A separation, s , between the rear surface 142 of the tongue 14 and a centreline of the lon-

itudinal groove 12, which is labelled X-X' in Fig. 4, is between 30 and 300 mm. The centreline X-X' of the longitudinal groove 12 and the separation, *s*, together define a plane subtending an angle, θ , of between 90 and 135 degrees to the rear surface 142 of the tongue, as is shown in Fig. 5.

[0034] Thus the obstruction 10 can be positioned such that the lowermost course of rails 203 is received in the longitudinal groove 12 and the tongue 14 overhangs the fishplate 53 on an outboard or seaward side thereof. The tongue 14 will point downwardly, provided that the fishplate 53 is not significantly taller than the separation, *f*, of the lowest course of rails 203 from the deck 51. "Not significantly taller" here means that the height of the fishplate 53 is not more than about 30 mm greater than the separation, *f*. In such a case, therefore, the top edge of the fishplate 53 is covered by the tongue 14 and can no longer provide an unauthorized potential boarder with a location to attach a hook or to gain a handhold in an attempt to board the vessel or marine installation.

[0035] On the other hand, if the fishplate 53 is significantly taller than the separation, *f*, of the lowermost course of rails 203 from the deck 51, if the obstruction 10 were again to be positioned such that the lowermost course of rails 203 was received in the longitudinal groove 12 with the tongue 14 overhanging the fishplate 53, the tongue 14 would instead point upwardly on an outboard or seaward side of the fishplate 53. The tongue 14 would then itself provide a possible location for an unauthorized potential boarder to attach a hook or to gain a handhold. In such a case, however, there is no need to use the obstruction 10 at all, since the top edge of the fishplate 53 can instead be rendered inaccessible to an unauthorized potential boarder by mounting a security bulwark along the perimeter railing 20 at a location above the fishplate 53. In such a case, an overhang on the underside of the security bulwark on the outboard or seaward side thereof prevents access to the top edge of the fishplate 53. Moreover, in such a case, since the fishplate 53 is taller than the separation, *f*, the fishplate itself completely covers the gap between the lowermost course of rails 203 and the deck 51.

[0036] However, in the case that the fishplate 53 is not significantly taller than the separation, *f*, the variety of different possible distances across the deck 51 of the perimeter railing 20 from the fishplate 53 and the variety of different possible heights of the fishplate are both accommodated by a combination of the two features of the obstruction 10 mentioned above: namely, that the longitudinal groove 12 is separated from the rear surface 142 of the tongue by between 30 and 300 mm, and that the angle, θ , is an obtuse angle of between 90 and 135 degrees. With this combination of features, the obstruction 10 is able to maintain a downward pointing orientation of the tongue 14 for a wide variety of different possible heights of fishplate and different possible distances of the perimeter railing 20 from the fishplate 53, across the deck 51.

[0037] The ability of the obstruction 10 to maintain the downward pointing orientation of the tongue 14 is further enhanced by another feature of this embodiment of the obstruction 10, which is that the tongue 14 has a thickness, *t*, which tapers in a direction away from the longitudinal groove 12. Thus if the rear surface 142 of the tongue adopts a downward pointing orientation, the tapering thickness, *t*, of the tongue 14 means that the front surface 144 points downwards more steeply than the rear surface 142 thereof.

[0038] The longitudinal groove 12 has a smoothly curved, concave profile, as may best be seen in Fig. 5. Thus the longitudinal groove 12 is adapted for rotation of the obstruction 10 about the lowermost course of rails 203, whereby the obstruction 10 may easily accommodate fishplates of different heights along the edge of the deck. In contrast, the upper surface 16 is convexly curved in a direction D-D' of the depth of the obstruction 10. This has two advantages, as follows. Firstly, it ensures that the upper surface 16 maintains a substantially constant height above the deck 51 as the obstruction 10 is rotated to suit different heights of fishplate and different separations, *f*, of the lowermost course of rails 203 from the deck 51. Thus the obstruction 10 is less likely to interfere with a security bulwark mounted above it on the perimeter railing 20. Secondly, however, it also helps to prevent the upper surface 16 of the obstruction 10 from being used by an unauthorized potential boarder as a location for a handhold. For the same reason, both the upper surface 16 and the front surface 144 are substantially smooth.

[0039] To allow the obstruction 10 to be secured to the perimeter railing 20, the obstruction 10 further comprises an attachment facility 11 proximate the longitudinal groove 12. In this particular embodiment, the attachment facility 11 comprises a plurality of through-holes 112 formed in the obstruction 10, allowing the obstruction 10 to be tied to the lowermost course of rails 203 for example, and/or to one or more of the vertical stanchions 204 of the perimeter railing 20. It may also be tied to an obstacle 23 permanently located on the deck of the vessel or marine installation, such as that which is represented in Fig. 2. However, in an alternative possible embodiment of the obstruction 10, the attachment facility 11 could instead comprise one or more clips for example, for clipping the obstruction 10 to the lowermost course of rails 203.

[0040] Even if the obstruction 10 is securely attached to the perimeter railing 20, rotation of the obstruction 10 about the lowermost course of rails 203 is undesirable, as this would expose the top edge of the fishplate 53. In such a case, an unauthorized potential boarder might try to flip the tongue 14 of the obstruction up, in order to gain access to the top edge of the fishplate 53 and use it as a handhold, for example. The obstruction 10 therefore further comprises an anti-rotation device 13 for impeding any such undesired rotation of the obstruction 10 about the lowermost course of rails 203. In this particular embodiment, the anti-rotation device 13 comprises a plural-

ity of through-holes 132 formed in the tongue 14. These allow the obstruction 10 to be tied to another, adjacent, similar obstruction or to one or more of the vertical stanchions 204 or support stays 205, for example. However, in other alternative possible embodiments of the obstruction 10, the anti-rotation device 13 could instead comprise a tang on the rear surface 142 of the tongue 14 for engagement with the fishplate 53, one or more arms for engagement with the vertical stanchions 204 or support stays 205, or one or more clips for clipping the obstruction 10 to an adjacent, similar obstruction.

[0041] In the embodiment shown in Figs. 3, 4 and 5, the obstruction 10 has a width, w , of approximately 980 mm. Since the vertical stanchions 204 of the perimeter railing 20 are spaced no more than 1.5 metres apart, and are often spaced 1 metre apart, the obstruction 10 can therefore usually fit comfortably between two adjacent stanchions 204. If the obstruction is made of high density polyethylene (HDPE) or of glass reinforced nylon, a small notch may easily be cut into it to allow the obstruction 10 to be mounted on the lowermost course of rails 203 across one of the vertical stanchions 204. Thus, a plurality of such obstructions may be arranged side-by-side and adjacent to each other along the perimeter of the vessel or marine installation by cutting notches into them at positions which correspond to the locations of the vertical stanchions 204.

[0042] The obstruction 10 shown in Figs. 3, 4 and 5 has a height, h , of approximately 300 mm, and the separation, s , between the rear surface 142 of the tongue 14 and the centreline X-X' of the longitudinal groove 12 is approximately 82 mm. These dimensions are sufficient to allow the obstruction 10 to overhang a wide variety of different possible heights of fishplate for different possible distances of the perimeter railing 20 across the deck 51 to the fishplate 53. In the embodiment of the obstruction 10 shown in Figs. 3, 4 and 5, the angle, θ , is approximately 103 degrees.

[0043] Figs. 6 and 7 respectively show views from an outside or seaward side and from an inside or deck side of an embodiment of a perimeter protection system 100 mounted on a perimeter railing 20 of a vessel or marine installation, such as that shown in Figs. 1 and 2. The perimeter protection system 100 comprises a plurality of obstructions 10a, 10b of the type shown and described above in relation to Figs. 3, 4 and 5, and a plurality of security bulwarks 1a, 1b, 1c for mounting to the perimeter railing 20 of the vessel or marine installation, above the obstructions. Each of the security bulwarks 1a, 1b, 1c may, for example, be of a type shown and described in UK patent no. GB 2 531 232 B, also in the name of the present applicant and the contents of which are incorporated herein by reference. The perimeter protection system 100 may further comprise one or more of another type of obstruction for positioning in a recess between an adjacent pair of the security bulwarks 1a, 1b and of a type shown and described in UK patent no. GB 2 535 681 B, also in the name of the present applicant and the

contents of which are incorporated herein by reference.

[0044] For illustrative purposes only, the vessel or marine installation is shown in Figs. 6 and 7 as having fishplates of two different heights, which are respectively labelled 53a, 53b. This is to show how the orientation of the obstructions 10a, 10b adjusts to suit the different heights of the fishplates. In reality, however, a vessel or marine installation normally has a fishplate which is of only a single height along the edge of its deck. In practice, since the fishplate has only a single height, the plurality of obstructions 10a, 10b can be arranged side-by-side and adjacent to each other along the perimeter of the vessel or marine installation, with the plurality of security bulwarks 1a, 1b, 1c arranged side-by-side and adjacent to each other along the perimeter railing 20 of the vessel or marine installation, above the obstructions.

[0045] The plurality of obstructions 10a, 10b and the plurality of security bulwarks 1a, 1b, 1c may be brightly coloured to advertise the presence of the perimeter protection system 100 to unauthorized potential boarders and to deter them from approaching the vessel or marine installation. Preferably, they are coloured safety orange.

[0046] The vessel or marine installation may further comprise cargo protected by the plurality of obstructions 10a, 10b and the plurality of security bulwarks 1a, 1b, 1c of the perimeter protection system 100.

Claims

1. An obstruction (10) for mounting along a perimeter of a vessel or marine installation, wherein the vessel or marine installation comprises a deck (51) having a perimeter railing (20) and an upstanding plate (53) along an edge of the deck, the obstruction having an elongate body comprising:

a longitudinal groove (12) for receiving a lowermost course of rails (203) of the perimeter railing; and

a tongue (14) for overhanging the plate (53) on an outboard or seaward side thereof, the tongue comprising a rear surface (142) intended to face in an inboard direction when the obstruction (10) is mounted along the perimeter of the vessel or marine installation;

characterized in that:

a separation (s) between the rear surface (142) of the tongue and a centreline (X-X') of the longitudinal groove (12) is between 30 and 300 mm; and

the centreline (X-X') of the longitudinal groove (12) and the separation (s) together define a plane subtending an angle (θ) of between 90 and 135 degrees to the rear surface (142) of the tongue.

2. An obstruction according to claim 1, wherein the tongue (14) has a thickness (t) which tapers in a direction away from the longitudinal groove (12).
3. An obstruction according to claim 1 or claim 2, wherein the longitudinal groove (12) is adapted for rotation of the obstruction (10) about the lowermost course of rails (203), whereby the obstruction can accommodate plates (53a, 53b) of different heights along the edge of the deck.
4. An obstruction according to any one of the preceding claims, further comprising an upper surface (16) intended to face upwards when the obstruction (10) is mounted along the perimeter of the vessel or marine installation, which upper surface is convexly curved in a direction (D-D') of the depth of the obstruction.
5. An obstruction according to claim 4, wherein the upper surface (16) is substantially smooth.
6. An obstruction according to any one of the preceding claims, wherein the tongue (14) comprises a front surface (144) intended to face in a seaward direction when the obstruction (10) is mounted along the perimeter of the vessel or marine installation, which front surface is substantially smooth.
7. An obstruction according to any one of the preceding claims, further comprising an attachment facility (11) proximate the longitudinal groove (12) for attaching the obstruction (10) to the lowermost course of rails (203).
8. An obstruction according to claim 7, wherein the attachment facility (11) comprises one or more through-holes (112) in the obstruction.
9. An obstruction according to any one of the preceding claims, further comprising an anti-rotation device (13) for impeding rotation of the obstruction (10) about the lowermost course of rails (203).
10. An obstruction according to claim 9, wherein the anti-rotation device (13) comprises one or more through-holes (132) in the tongue (14).
11. An obstruction according to any one of the preceding claims, wherein the obstruction (10) has a width (w) of between 0.70 and 1.50 metres.
12. An obstruction according to any one of the preceding claims, wherein the tongue (14) has a height (h) of between 200 and 600 mm.
13. A perimeter protection system (100) comprising:

a plurality of obstructions (10a, 10b) according
- to any one of claims 1 to 12; and
a plurality of security bulwarks (1a, 1b, 1c) for mounting to the perimeter railing (20) of the vessel or marine installation, above the obstructions.
14. A vessel or marine installation comprising:

a plurality of obstructions (10a, 10b) according to any one of claims 1 to 12 arranged side-by-side and adjacent to each other along the perimeter of the vessel or marine installation; and
a plurality of security bulwarks (1a, 1b, 1c) arranged side-by-side and adjacent to each other along the perimeter railing (20) of the vessel or marine installation, above the obstructions.
15. A vessel or marine installation according to claim 14, further comprising cargo protected by the plurality of obstructions (10a, 10b) and the plurality of security bulwarks (1a, 1b, 1c).
16. A method of protecting a perimeter of a vessel or marine installation, wherein the vessel or marine installation comprises a deck (51) having a perimeter railing (20) and an upstanding plate (53) along an edge of the deck, the method comprising:

positioning a plurality of obstructions (10a, 10b) according to any one of claims 1 to 12 side-by-side and adjacent to each other along the perimeter of the vessel or marine installation;
receiving a lowermost course of rails (203) of the perimeter railing in the longitudinal grooves (12) of the obstructions; and
hanging the tongues (14) of the obstructions over the plate (53) on an outboard or seaward side thereof.
17. A method according to claim 16, further comprising: attaching at least one of the obstructions (10a, 10b) to the perimeter railing (20).
18. A method according to claim 16 or claim 17, further comprising: impeding rotation of at least one of the obstructions (10a, 10b) about the lowermost course of rails (203).
19. A method according to any one of claims 16 to 18, further comprising:

positioning a plurality of security bulwarks (1a, 1b, 1c) side-by-side and adjacent to each other along the perimeter railing of the vessel or marine installation, above the obstructions.

Patentansprüche

1. Hindernis (10) zur Montage entlang einer Umzäunung eines Schiffes oder einer auf dem Meer befindlichen Anlage, wobei das Schiff oder die auf dem Meer befindliche Anlage ein Deck (51) aufweist, das eine Umzäunungsreling (20) und eine nach oben stehende Platte (53) entlang eines Rands des Decks hat, wobei das Hindernis einen länglichen Körper hat, aufweisend:
 - eine Längsnut (12) zum Aufnehmen eines untersten Rangs von Geländern (203) der Umzäunungsreling; und
 - eine Zunge (14) zum Überhängen über die Platte (53) auf deren außenbords oder seewärts weisender Seite, wobei die Zunge eine Rückseite (142) aufweist, die dazu gedacht ist, in eine binnenbords gerichtete Richtung zu weisen, wenn das Hindernis (10) entlang der Umzäunung des Schiffes oder der auf dem Meer befindlichen Anlage montiert ist;

dadurch gekennzeichnet, dass:

 - ein Abstand (s) zwischen der Rückseite (142) der Zunge und einer Mittellinie (X-X') der Längsnut (12) zwischen 30 und 300 mm beträgt; und
 - die Mittellinie (X-X') der Längsnut (12) und der Abstand (s) zusammen eine Ebene definieren, die mit der Rückseite (142) der Zunge einen Winkel (θ) von zwischen 90 und 135 Grad einschließt.
2. Hindernis gemäß Anspruch 1, wobei die Zunge (14) eine Dicke (t) hat, die sich in einer Richtung von der Längsnut (12) weg verjüngt.
3. Hindernis gemäß Anspruch 1 oder 2, wobei die Längsnut (12) zur Drehung des Hindernisses (10) um den untersten Rang von Geländern (203) angepasst ist, wodurch sich das Hindernis auf Platten (53a, 53b) unterschiedlicher Höhen entlang dem Rand des Decks einstellen kann.
4. Hindernis gemäß einem der vorhergehenden Ansprüche, ferner aufweisend eine obere Oberfläche (16), die dazu gedacht ist, nach oben zu weisen, wenn das Hindernis (10) entlang der Umzäunung des Schiffes oder der auf dem Meer befindlichen Anlage montiert ist, wobei die obere Oberfläche in einer Richtung (D-D') der Tiefe des Hindernisses konvex gekrümmt ist.
5. Hindernis gemäß Anspruch 4, wobei die obere Oberfläche (16) im Wesentlichen glatt ist.
6. Hindernis gemäß einem der vorhergehenden Ansprüche, wobei die Zunge (14) eine vordere Oberfläche (144) aufweist, die dazu gedacht ist, in einer seewärts gerichteten Richtung zu weisen, wenn das Hindernis (10) entlang der Umzäunung des Schiffes oder der auf dem Meer befindlichen Anlage montiert ist, wobei die vordere Oberfläche im Wesentlichen glatt ist.
7. Hindernis gemäß einem der vorhergehenden Ansprüche, ferner aufweisend eine Befestigungseinrichtung (11) in der Nähe der Längsnut (12) zum Befestigen des Hindernisses (10) an dem untersten Rang von Geländern (203).
8. Hindernis gemäß Anspruch 7, wobei die Befestigungseinrichtung (11) eine oder mehrere Durchgangsbohrungen (112) in dem Hindernis aufweist.
9. Hindernis gemäß einem der vorhergehenden Ansprüche, ferner aufweisend eine Verdrehsicherungsvorrichtung (13) zur Verhinderung eines Verdrehens des Hindernisses (10) um den untersten Rang von Geländern (203).
10. Hindernis gemäß Anspruch 9, wobei die Verdrehsicherungsvorrichtung (13) eine oder mehrere Durchgangsbohrungen (132) in der Zunge (14) aufweist.
11. Hindernis gemäß einem der vorhergehenden Ansprüche, wobei das Hindernis (10) eine Breite (w) hat, die zwischen 0,70 und 1,50 m beträgt.
12. Hindernis gemäß einem der vorhergehenden Ansprüche, wobei die Zunge (14) eine Höhe (h) hat, die zwischen 200 und 600 mm beträgt.
13. Umzäunungsschutzsystem (100), aufweisend:
 - mehrere Hindernisse (10a, 10b) gemäß einem der Ansprüche 1 bis 12; und
 - mehrere Sicherheitsschanzkleider (1a, 1b, 1c) zum Montieren an der Umzäunungsreling (20) des Schiffes oder der auf dem Meer befindlichen Anlage oberhalb der Hindernisse.
14. Schiff oder auf dem Meer befindliche Anlage, aufweisend:
 - mehrere Hindernisse (10a, 10b) gemäß einem der Ansprüche 1 bis 12, die nebeneinander und aneinander anliegend entlang der Umzäunung des Schiffes oder der auf dem Meer befindlichen Anlage angeordnet sind; und
 - mehrere Sicherheitsschanzkleider (1a, 1b, 1c), die nebeneinander und aneinander anliegend entlang der Umzäunungsreling (20) des Schiffes oder der auf dem Meer befindlichen Anlage oberhalb der Hindernisse angeordnet sind.

15. Schiff oder auf dem Meer befindliche Anlage gemäß Anspruch 14, ferner aufweisend eine Fracht, die von den mehreren Hindernissen (10a, 10b) und den mehreren Sicherheitsschanzkleidern (1a, 1b, 1c) geschützt ist.

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16. Verfahren zum Schützen einer Umzäunung eines Schiffes oder einer auf dem Meer befindlichen Anlage, wobei das Schiff oder die auf dem Meer befindliche Anlage ein Deck (51) aufweist, das eine Umzäunungsreling (20) und eine nach oben stehende Platte (53) entlang einem Rand des Decks hat, wobei das Verfahren aufweist:

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Positionieren mehrerer Hindernisse (10a, 10b) gemäß einem der Ansprüche 1 bis 12 nebeneinander und aneinander anliegend entlang der Umzäunung des Schiffes oder der auf dem Meer befindlichen Anlage;

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Aufnehmen eines untersten Rangs von Geländern (203) der Umzäunungsreling in den Längsnuten (12) der Hindernisse; und

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Hängen der Zungen (14) der Hindernisse über die Platte (53) auf deren nach außenbords oder seewärts weisender Seite.

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17. Verfahren gemäß Anspruch 16, ferner aufweisend: Befestigen mindestens eines der Hindernisse (10a, 10b) an der Umzäunungsreling (20).

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18. Verfahren gemäß Anspruch 16 oder Anspruch 17, ferner aufweisend:

Verhindern einer Drehung mindestens eines der Hindernisse (10a, 10b) um den untersten Rang von Geländern (203).

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19. Verfahren gemäß einem der Ansprüche 16 bis 18, ferner aufweisend:

Positionieren mehrerer Sicherheitsschanzkleider (1a, 1b, 1c) nebeneinander und aneinander anliegend entlang der Umzäunungsreling des Schiffes oder der auf dem Meer befindlichen Anlage oberhalb der Hindernisse.

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Revendications

1. Obstacle (10) destiné à être monté le long d'un périmètre d'un vaisseau ou d'une installation marine, dans lequel le vaisseau ou l'installation marine comprend un pont (51) ayant un garde-corps de périmètre (20) et une plaque verticale (53) le long d'un bord du pont, l'obstacle ayant un corps allongé comprenant :

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une rainure longitudinale (12) pour recevoir la ligne la plus basse des rampes (203) du garde-corps de périmètre ; et

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une languette (14) pour surplomber la plaque (53) sur un côté extérieur ou vers la mer de celle-ci, la languette comprenant une surface arrière (142) prévue pour être orientée vers l'intérieur lorsque l'obstacle (10) est monté le long du périmètre du vaisseau ou de l'installation marine ; **caractérisé en ce que :**

une séparation (s) entre la surface arrière (142) de la languette et une ligne centrale (X-X') de la rainure longitudinale (12) est comprise entre 30 et 300 mm ; et la ligne centrale (X-X') de la rainure longitudinale (12) et la séparation (s) définissent ensemble un plan sous-tendant un angle (θ) compris entre 90 et 135 degrés par rapport à la surface arrière (142) de la languette.

2. Obstacle selon la revendication 1, dans lequel la languette (14) a une épaisseur (t) qui s'effile dans une direction s'éloignant de la rainure longitudinale (12).

3. Obstacle selon la revendication 1 ou 2, dans lequel la rainure longitudinale (12) est adaptée pour faire tourner l'obstacle (10) autour de la ligne la plus basse des rampes (203), moyennant quoi l'obstacle peut loger des plaques (53a, 53b) de hauteurs différentes le long du bord du pont.

4. Obstacle selon l'une quelconque des revendications précédentes, comprenant en outre une surface supérieure (16) prévue pour être orientée vers le haut lorsque l'obstacle (10) est monté le long du périmètre du vaisseau ou de l'installation marine, laquelle surface supérieure est courbée de manière convexe dans une direction (D-D') de la profondeur de l'obstacle.

5. Obstacle selon la revendication 4, dans lequel la surface supérieure (16) est sensiblement lisse.

6. Obstacle selon l'une quelconque des revendications précédentes, dans lequel la languette (14) comprend une surface avant (144) prévue pour être orientée vers la mer lorsque l'obstacle (10) est monté le long du périmètre du vaisseau ou de l'installation marine, laquelle surface avant est sensiblement lisse.

7. Obstacle selon l'une quelconque des revendications précédentes, comprenant en outre un élément de fixation (11) proche de la rainure longitudinale (12) pour fixer l'obstacle (10) à la ligne la plus basse des rampes (203).

8. Obstacle selon la revendication 7, dans lequel l'élément de fixation (11) comprend un ou plusieurs trou(s) traversant(s) (112) dans l'obstacle.

9. Obstacle selon l'une quelconque des revendications précédentes, comprenant en outre un dispositif anti-rotation (13) pour empêcher une rotation de l'obstacle (10) autour de la ligne la plus basse des rampes (203). 5
10. Obstacle selon la revendication 9, dans lequel le dispositif anti-rotation (13) comprend un ou plusieurs trou(s) traversant(s) (132) dans la languette (14). 10
11. Obstacle selon l'une quelconque des revendications précédentes, dans lequel l'obstacle (10) a une largeur (w) comprise entre 0,70 et 1,50 mètres.
12. Obstacle selon l'une quelconque des revendications précédentes, dans lequel la languette (14) a une hauteur (h) comprise entre 200 et 600 mm. 15
13. Système de protection de périmètre (100) comprenant : 20
 une pluralité d'obstacles (10a, 10b) selon l'une quelconque des revendications 1 à 12 ; et
 une pluralité de pavois de sécurité (1a, 1b, 1c) destinés à être montés sur le garde-corps de périmètre (20) du vaisseau ou de l'installation marine, au-dessus des obstacles. 25
14. Vaisseau ou installation marine comprenant : 30
 une pluralité d'obstacles (10a, 10b) selon l'une quelconque des revendications 1 à 12 agencés côte à côte et adjacents les uns aux autres le long du périmètre du vaisseau ou de l'installation marine ; et 35
 une pluralité de pavois de sécurité (1a, 1b, 1c) agencés côte à côte et adjacents les uns aux autres le long du garde-corps de périmètre (20) du vaisseau ou de l'installation marine, au-dessus des obstacles. 40
15. Vaisseau ou installation marine selon la revendication 14, comprenant en outre une cargaison protégée par la pluralité d'obstacles (10a, 10b) et la pluralité de pavois de sécurité (1a, 1b, 1c). 45
16. Procédé de protection d'un périmètre d'un vaisseau ou d'une installation marine, dans lequel le vaisseau ou l'installation marine comprend un pont (51) ayant un garde-corps de périmètre (20) et une plaque verticale (53) le long d'un bord du pont, le procédé comprenant les étapes consistant : 50
 à positionner une pluralité d'obstacles (10a, 10b) selon l'une quelconque des revendications 1 à 12 côte à côte et adjacents les uns aux autres le long du périmètre du vaisseau ou de l'installation marine ; 55
- à recevoir la ligne la plus basse des rampes (203) du garde-corps de périmètre dans les rainures longitudinales (12) des obstacles ; et
 à suspendre les languettes (14) des obstacles sur la plaque (53) sur un côté extérieur ou vers la mer de celles-ci.
17. Procédé selon la revendication 16, comprenant en outre l'étape consistant :
 à fixer au moins l'un des obstacles (10a, 10b) sur le garde-corps de périmètre (20).
18. Procédé selon la revendication 16 ou 17, comprenant en outre l'étape consistant :
 à empêcher une rotation d'au moins l'un des obstacles (10a, 10b) autour de la ligne la plus basse des rampes (203).
19. Procédé selon l'une quelconque des revendications 16 à 18, comprenant en outre l'étape consistant :
 à positionner une pluralité de pavois de sécurité (1a, 1b, 1c) côte à côte et adjacents les uns aux autres le long du garde-corps de périmètre du vaisseau ou de l'installation marine, au-dessus des obstacles.

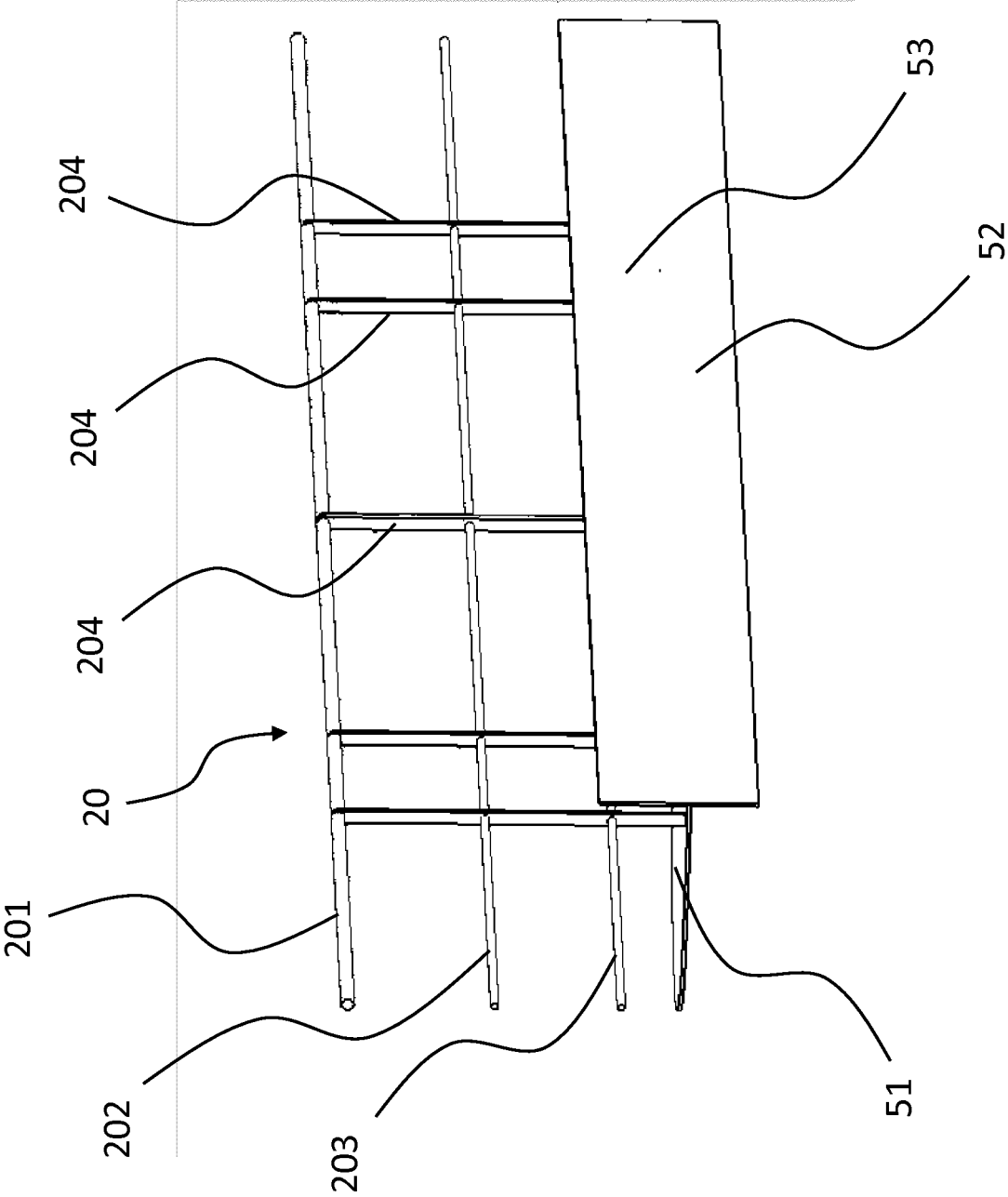


Fig. 1

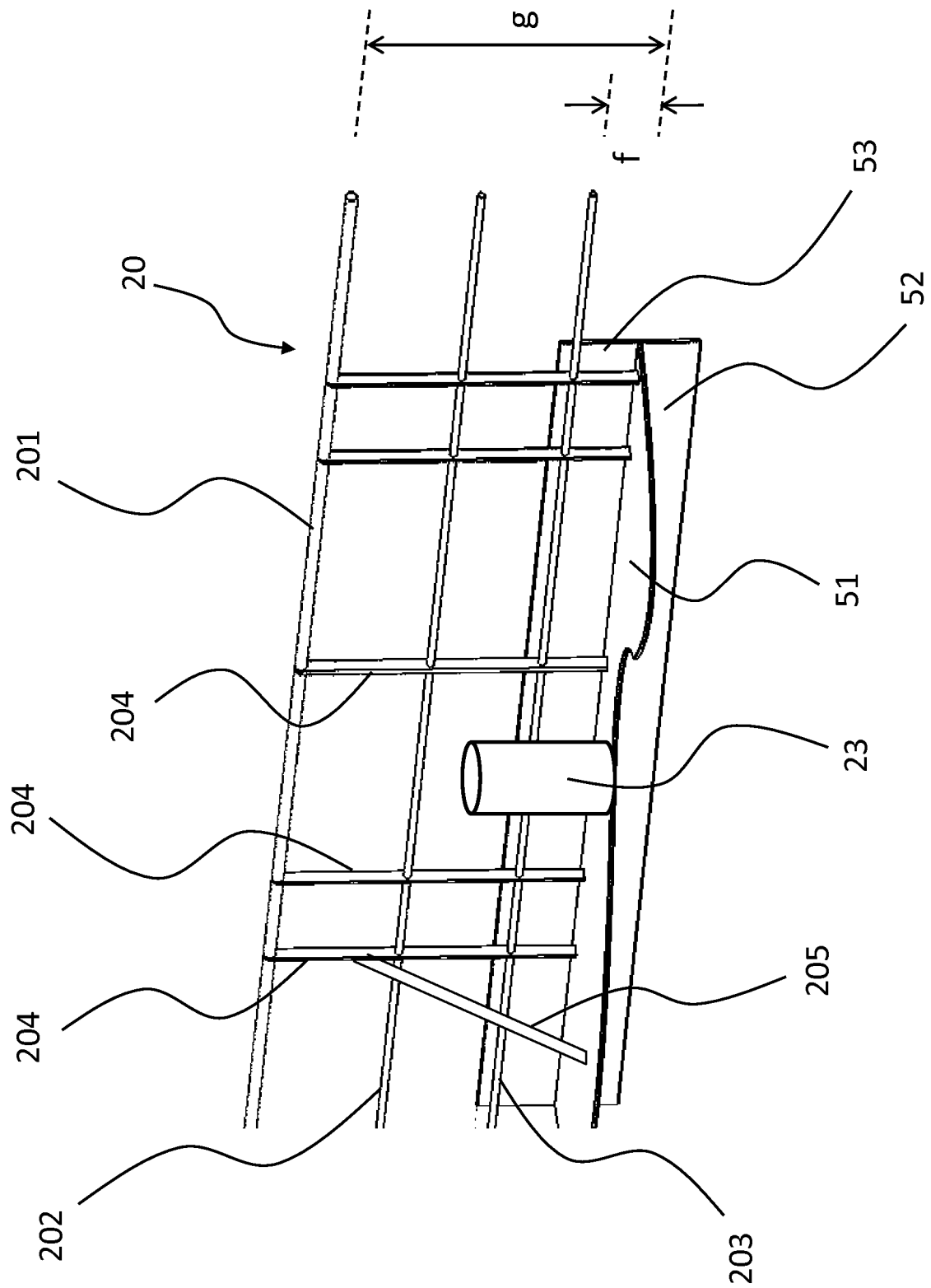


Fig. 2

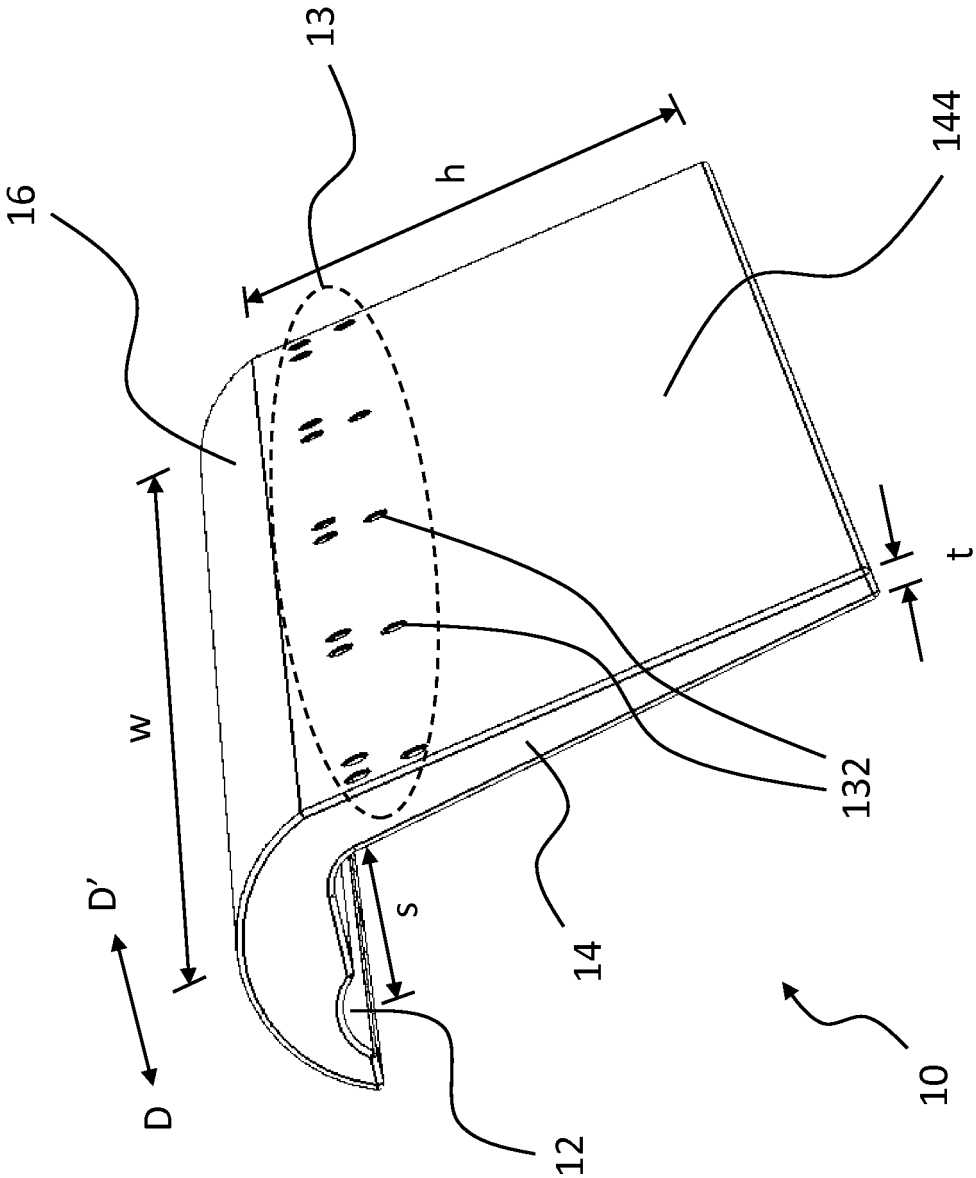


Fig. 3

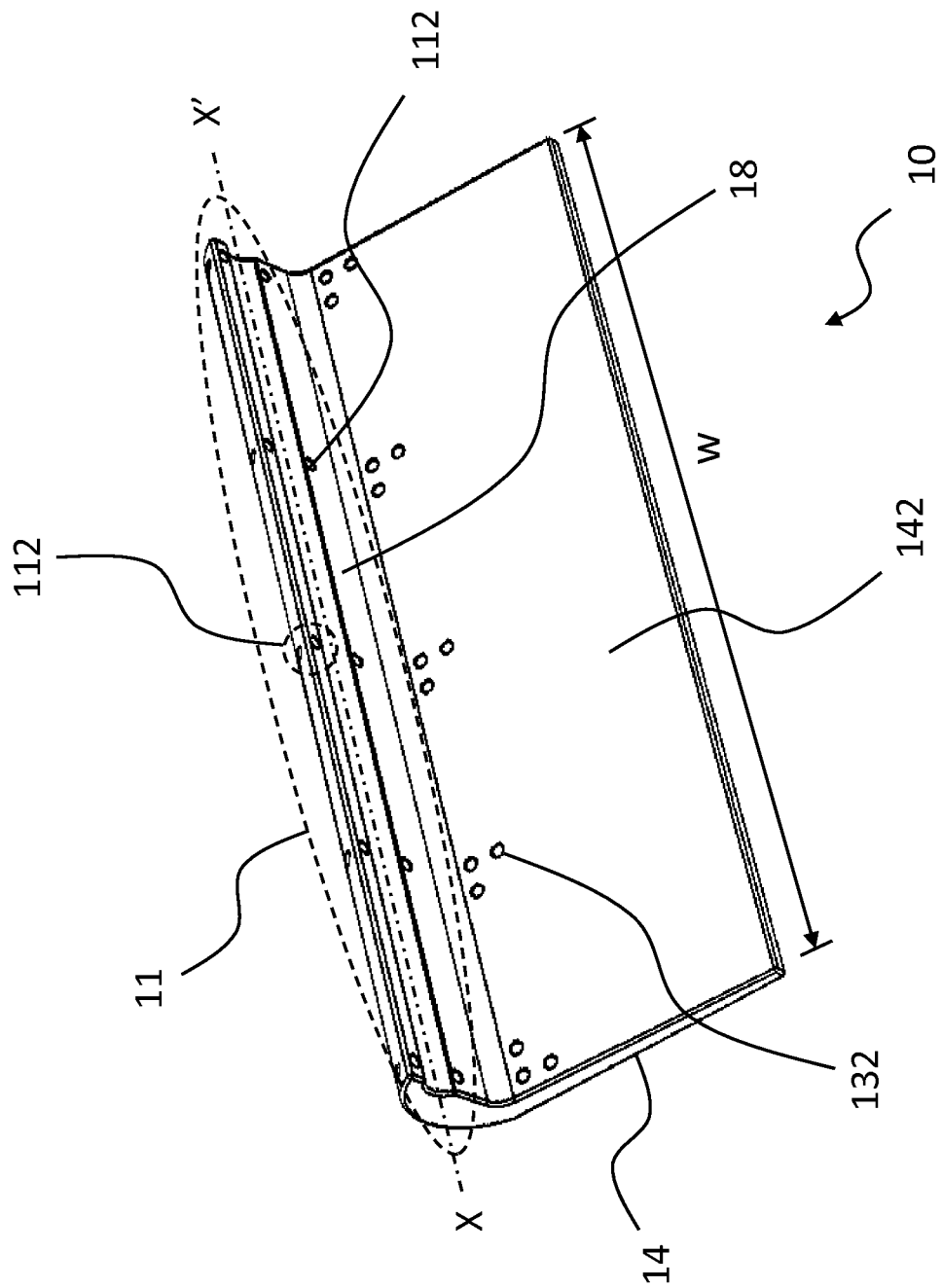


Fig. 4

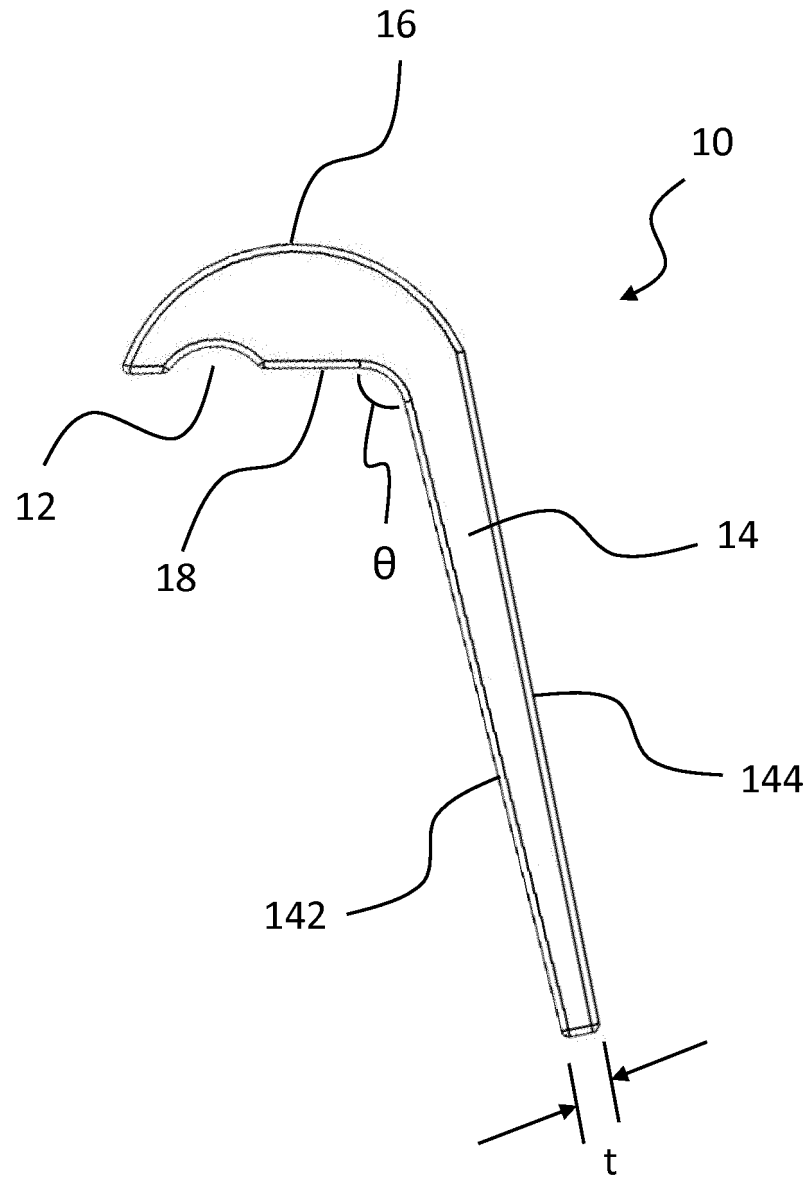
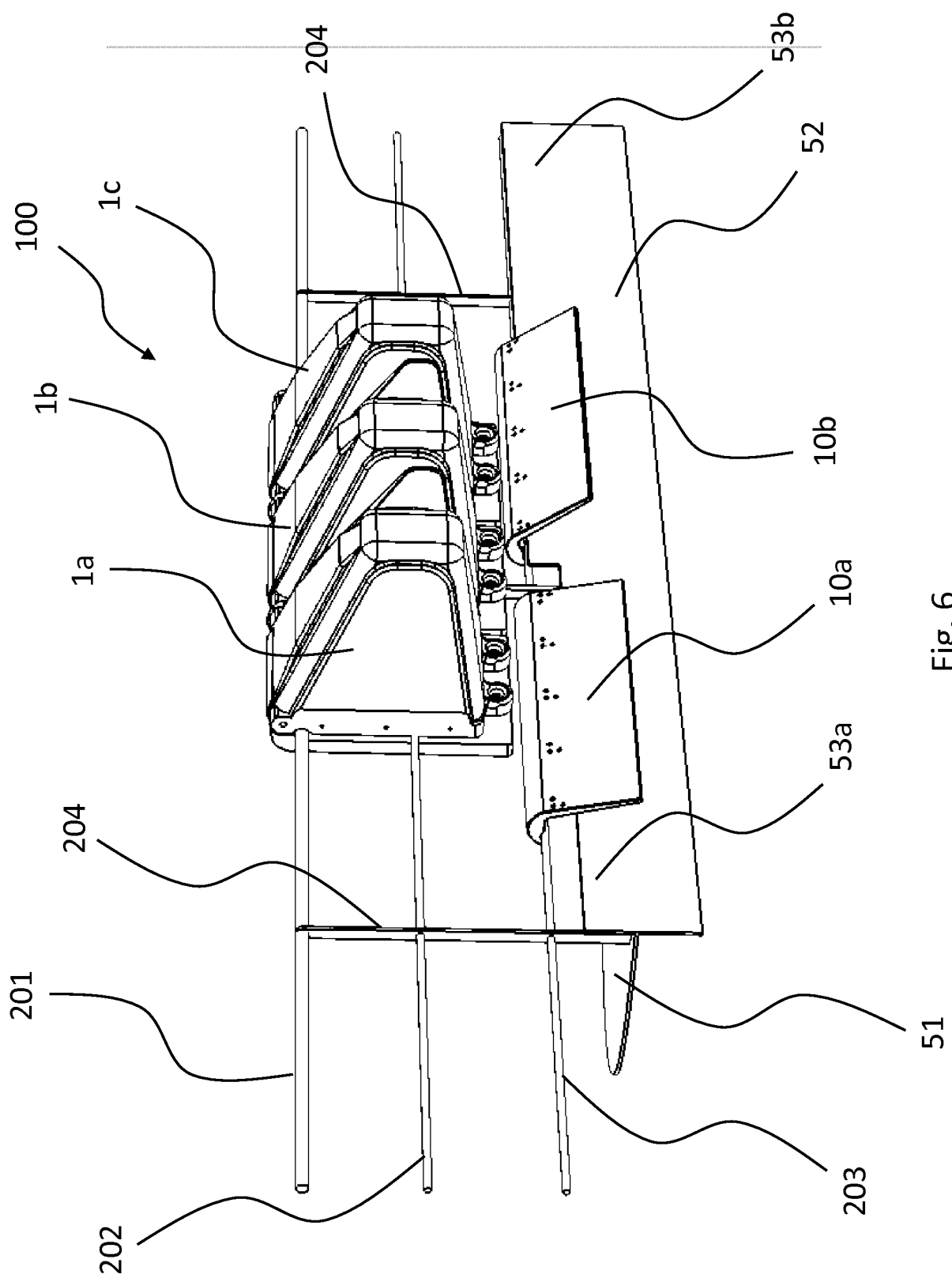


Fig. 5



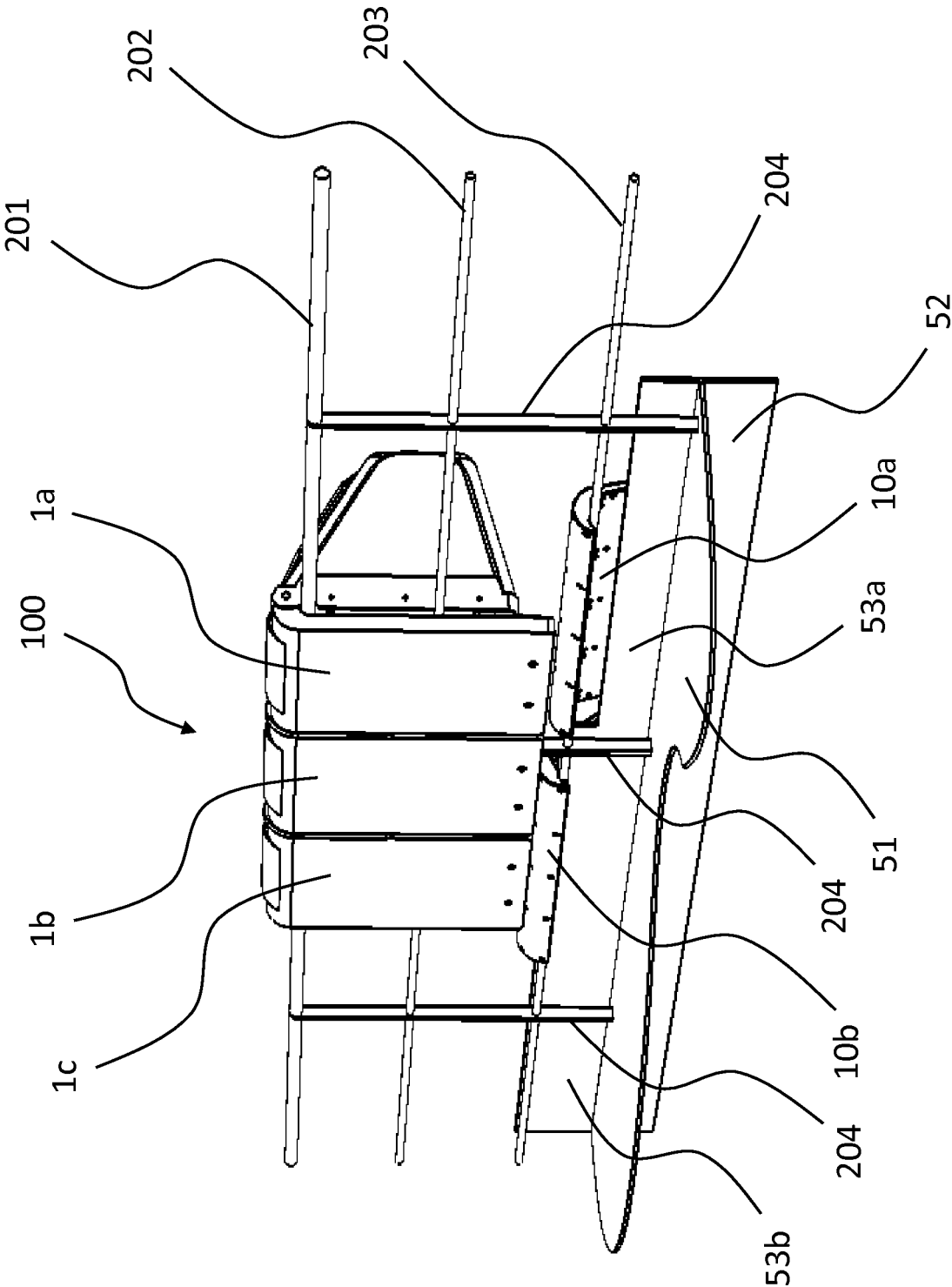


Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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