A rat guard for a ship, installed on a rope which connects a quay and a ship, to prevent hygiene-threatening animals, such as rats, snakes and cats from boarding the ship. The rat guard comprises a first plate defined with a first rope groove in a center portion of a right end thereof to be placed on one side in a lengthwise direction of the rope; a second plate defined with a second rope groove in a center portion of a left end thereof to be placed on the other side in the lengthwise direction of the rope; and a hinge part for hingedly coupling the first and second plates with each other using a hinge pin which is passed through the first and second plates at a position above and spaced apart from the first and second rope grooves by a predetermined distance.
RAT GUARD FOR SHIP

CROSS REFERENCE


BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a rat guard for a ship and, more particularly, to a rat guard for a ship which is installed to prevent hygiene-threatening animals, such as rats, snakes and cats, from boarding a ship along a rope while the ship is docked in a quay.

[0004] 2. Description of the Prior Art

[0005] In general, marine transportation means such as ships must be docked at a quay for a certain period in order to unload cargo or passengers or to be supplied with fuel or articles needed for sailing.

[0006] The docked transportation means is prevented from moving away from the quay by tying a rope on a ship to a support structure on a quay. At this time, in order to prevent hygiene-threatening animals, such as rats, snakes and cats, which inhabit warehouses on the quay, from boarding a ship by moving along the rope, a rat guard for a ship is installed on the rope. The conventional rat guard for preventing the entry of rats or the like into a ship is illustrated in FIG. 1.

[0007] Referring to FIG. 1, in the conventional rat guard, a groove 102 is defined in a circular plate 100 in such a way as to extend from the periphery to the center of the circular plate 100. A rotation door 110 to be fitted in the groove 102 is hingedly coupled to the plate 100 on one side of the groove 102 by means of hinge pins 112. The rotation door 110 can be fastened and locked to the plate 100 on the other side of the groove 102 by means of a conventional locking member 120.

[0008] The conventional rat guard, constructed as mentioned above, is installed in a manner such that the rotation door 110 is rotated in one direction to open the groove 102, a rope 130 is inserted into the groove 102 to be placed at the inner end of the groove 102, the rotation door 110 is rotated in the other direction to close the groove 102, and the rotation door 110 is locked to the plate 100 by means of the locking member 120, so that hygiene-threatening animals, such as rats, snakes and cats, are prevented from boarding a ship.

[0009] However, in the conventional rat guard, in order to close the groove 102, a user must directly rotate the rotation door 110 in both directions. However, since it is not easy for the user to reach the rotation door 110 when the length of the rope 130 is substantial, it is difficult to directly rotate the rotation door 110.

[0010] In consideration of this, while some users use the rat guard with the groove 102 open, because rats or the like can then pass through the open groove 102, even though the plate 100 is installed on the rope 130, rats, etc. can board a ship, thus compromising hygiene or infecting people with diseases.

[0011] Further, if the plate 100 is installed on the rope 130 with the groove 120 open, when the rope 130 is severely shaken by sea wind or waves, the plate 100 is likely to be released from the rope 130, and rats or the like can easily board a ship.

SUMMARY OF THE INVENTION

[0012] Accordingly, the present invention has been made keeping in mind the above problems occurring in the prior art, and an object of the present invention is to provide a rat guard for a ship which is simply constructed using a first plate and a second plate so as to remove the space through which rats or the like inhabiting a quay can board a ship along a rope.

[0013] In order to achieve the above object, according to one aspect of the present invention, there is provided a rat guard for a ship, installed on a rope which is connected to a quay and a ship, to prevent hygiene-threatening animals, such as rats, snakes and cats, from boarding the ship, the rat guard comprising a first plate defined with a first rope groove in the center portion of a right end thereof to be placed on one side of the rope in the lengthwise direction of the rope; a second plate defined with a second rope groove in the center portion of a left end thereof to be placed on the other side of the rope in the lengthwise direction of the rope; and a hinge part for hingedly coupling the first and second plates with each other using a hinge pin which passes through the first and second plates at a position separated upwards from the first and second rope grooves by a predetermined distance.

[0014] According to another aspect of the present invention, connection holes are respectively defined through the left upper portion of the first plate and the right upper portion of the second plate adjacent to outer peripheries of the first and second plates, and an operation cord is connected through the connection holes, so that the rotation of the first and second plates can be controlled by moving the operation cord upwards and downwards.

[0015] According to another aspect of the present invention, a guide projection is formed on one of the first and second plates which can be rotated around the hinge part, and a guide slot is defined through the other of the first and second plates, so that the guide projection is inserted through and moved along the guide slot to guide the rotation of the first and second plates.

[0016] According to another aspect of the present invention, position-fixing protuberances are projectedly formed on edges of the first and second rope grooves, which face the rope, so that, when the first and second plates are positioned around the rope with the rope extending through the first and second rope grooves, the position-fixing protuberances are driven into the rope to fix the installation position of the rat guard.

[0017] According to another aspect of the present invention, the hinge part is provided with a washer which has protuberances on the outer surface thereof to be driven into the rope extending through the first and second rope grooves.

[0018] According to another aspect of the present invention, a weight is provided on the lower end of at least one of the first and second plates so that the first and second plates are prevented from being released from the rope by external shock.

[0019] According to still another aspect of the present invention, in order to prevent the first and second plates from being rotated beyond a predetermined angle, an engagement
piece is projectedly formed on the first plate at a position that is engaged with the left end of the second plate to restrain the rotation of the second plate or on the second plate at a position to be engaged with the right end of the first plate to restrain the rotation of the first plate.

According to a still further aspect of the present invention, an engagement tab is formed adjacent to the lower left or lower right end of one of the first and second plates, which is not formed with the engagement piece, to project toward the other of the first and second plates, which is not formed with the engagement tab.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0021] The above and other objects, features and other advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

[0022] FIG. 1 is a perspective view illustrating a conventional rat guard for a ship;

[0023] FIG. 2 is an exploded perspective view illustrating a rat guard for a ship in accordance with a first embodiment of the present invention;

[0024] FIG. 3 is a view illustrating the open state of the rat guard for a ship in accordance with the first embodiment of the present invention;

[0025] FIG. 4 is a view illustrating the closed state of the rat guard for a ship in accordance with the first embodiment of the present invention;

[0026] FIG. 5 is a view illustrating the open state of a rat guard for a ship in accordance with a second embodiment of the present invention;

[0027] FIG. 6 is a view illustrating the closed state of the rat guard for a ship in accordance with the second embodiment of the present invention.

**DETAILED DESCRIPTION OF THE INVENTION**

[0028] Reference will now be made in greater detail to a preferred embodiment of the invention, an example of which is illustrated in the accompanying drawings. Wherever possible, the same reference numerals will be used throughout the drawings and the description to refer to the same or like parts.

[0029] FIG. 2 is an exploded perspective view illustrating a rat guard for a ship in accordance with a first embodiment of the present invention.

[0030] Referring to FIG. 2, in accordance with a first embodiment of the present invention, a rat guard for a ship, installed on a rope 50 (see FIG. 3) which connects a quay and a ship, to prevent hygiene-threatening animals such as rats, snakes and cats from boarding the ship, has a simple construction which includes a first plate 10, a second plate 20, and a hinge part for hingedly coupling the first and second plates 10 and 20 with each other.

[0031] The first and second plates 10 and 20 have a predetermined size which does not permit the passage of a rat or the like, and are formed to have a semi-circular shape. The first and second plates 10 and 20 are coupled with each other in a manner such that the left and right ends of the respective first and second plates 10 and 20, which have a length corresponding to the diameter of a circle, face each other. The rat guard has a first rope groove 11, a second rope groove 21, the hinge part, connection holes 13 and 23, a guide slot 14, a guide projection 24, weights 15 and 25, an engagement piece 26, an engagement tab 16, and locking holes 17 and 27.

[0032] The first rope groove 11 is defined at the center portion of the right end of the first plate 10 to have a concave shape so that the first plate 10 can be placed on one side of the rope 50 in the lengthwise direction of the rope 50.

[0033] The second rope groove 21 is defined at the center portion of the left end of the second plate 20 to have a concave shape corresponding to that of the first rope groove 11 so that the second plate 20 can be placed on the other side of the rope 50 in the lengthwise direction of the rope 50.

[0034] Position-fixing protuberances 11a and 21a are projectedly formed on the edges of the first and second rope grooves 11 and 21 which face the rope 50, so that, when the first and second plates 10 and 20 are positioned around the rope 50 with the rope 50 extending through the first and second rope grooves 11 and 21, the position-fixing protuberances 11a and 21a are driven into the rope 50 to fix the installation position of the rat guard on the rope 50.

[0035] The hinge part includes hinge holes 12 and 22 which are defined through the respective first and second plates 10 and 20, and a hinge pin 30 (see FIG. 3) which is inserted through the hinge holes 12 and 22. In detail, the hinge holes 12 and 22 are defined through the respective first and second plates 10 and 20 at positions which are separated upwards from the first and second rope grooves 11 and 21 of the first and second plates 10 and 20 by a predetermined distance, such that the hinge holes 12 and 22 communicate each other. The hinge pin 30 is inserted through the hinge holes 12 and 22. In this way, the first and second plates 10 and 20 are hingedly coupled with each other.

[0036] The connection holes 13 and 23 are defined to allow an operation cord 40 (see FIG. 3), which will be described later, to be connected to the first and second plates 10 and 20. The connection holes 13 and 23 are respectively perforated, in the shape of through-holes, through the left upper portion of the first plate 10 and the right upper portion of the second plate 20 adjacent to the outer peripheries of the first and second plates 10 and 20. The operation cord 40 is connected to the first and second plates 10 and 20 through the connection holes 13 and 23. The upper end of the operation cord 40 is formed as one strand that is easily grasped by a user, and the lower end of the operation cord 40 is divided into two strands that are respectively connected to the first and second plates 10 and 20 through the connection holes 13 and 23.

[0037] As a consequence, when the first and second plates 10 and 20 are installed around the rope 50, the user can easily place the rat guard at a desired position by manipulating the operation cord 40. Further, the rotation of the first and second plates 10 and 20 on the rope 50 can be controlled by moving the operation cord 40 upwards and downwards.

[0038] The guide slot 14 and the guide projection 24 function to guide the rotation of the first and second plates 10 and 20 around the hinge pin 30, which are hingedly coupled with each other by the hinge part. The guide projection 24 is formed on one of the first and second plates 10 and 20, which are rotated around the hinge part, and the guide slot 14 is defined through the other of the first and second plates 10 and 20, so that the guide projection 24 is inserted through and moved along the guide slot 14 to guide the rotation of the first and second plates 10 and 20. In the present embodiment, the guide slot 14 is defined on one
surface of the first plate 10, and the guide projection 24 is formed on the facing surface of the second plate 20 at a position that corresponds to the guide slot 14. Therefore, the guide slot 14 and the guide projection 24 perform a guiding function so that the first and second plates 10 and 20 can be smoothly rotated with respect to each other.

[0039] The weights 15 and 25 are secured to respective lower ends of the first and second plates 10 and 20. Accordingly, when the rope 50, which is placed to extend through the first and second rope grooves 11 and 21 of the first and second plates 10 and 20, is shaken by external forces such as sea wind or waves, the first and second plates 10 and 20 are prevented from being released from the rope 50 by the mass of the weights 15 and 25.

[0040] When the first and second plates 10 and 20 are rotated with respect to each other, in order to prevent the right end of the first plate 10 and the left end of the second plate 20 from being rotated beyond a predetermined angle, the engagement piece 26 is projectedly formed on the first plate 10 at a position such that it is engaged with the left end of the second plate 20 to restrain the rotation of the second plate 20, or on the second plate 20 at a position such that it is engaged with the right end of the first plate 10 to restrain the rotation of the first plate 10. In the present embodiment, the engagement piece 26 is projectedly formed on the second plate 20 at a position that is engaged with the right end of the first plate 10 to restrain the rotation of the first plate 10.

[0041] Therefore, if the first and second plates 10 and 20 are rotated with respect to each other by the predetermined angle, as the right end of the first plate 10 is engaged with the engagement piece 26 of the second plate 20, the first and second plates 10 and 20 are prevented from being rotated beyond the predetermined angle. Due to this fact, it is also possible to prevent the guide projection 24 of the second plate 20 from being released from the guide slot 14 of the first plate 10.

[0042] The engagement tab 16 is formed adjacent to the lower end on the left end or the right end of one of the first and second plates 10 and 20, which is not formed with the engagement piece 26, to project toward the other of the first and second plates 10 and 20, which is not formed with the engagement tab 16. In the present embodiment, the engagement tab 16 is formed on the right end of the first plate 10 to project toward the left end of the second plate 20 so that the left end of the second plate 20 can be engaged with the engagement tab 16.

[0043] The locking holes 17 and 27 are respectively defined through the lower ends of the right and left ends of the first and second plates 10 and 20. A locking member is inserted and locked through the locking holes 17 and 27 to prevent the first and second plates 10 and 20, installed on the rope 50, from being unintentionally rotated thereon.

[0044] Hereafter, the functioning of the rat guard for a ship in accordance with the first embodiment of the present invention will be described.

[0045] FIG. 3 is a view illustrating the open state of the rat guard for a ship in accordance with the first embodiment of the present invention, and FIG. 4 is a view illustrating the closed state of the rat guard for a ship in accordance with the first embodiment of the present invention.

[0046] Referring to FIGS. 3 and 4, in accordance with the first embodiment of the present invention, the rat guard for a ship, installed on the rope 50 which connects a quay and a ship, to prevent hygiene-threatening animals such as rats, snakes and cats from boarding the ship, is provided. In order to install the rat guard on the rope 50, the operation rope 40, which is connected to the first and second plates 10 and 20 through the connection holes 13 and 23, is pulled upwards.

[0047] Then, as the first and second plates 10 and 20, which are connected to the lower end of the operation cord 40, are rotated around the hinge pin 30, the predetermined angle is defined between the right end of the first plate 10 and the left end of the second plate 20. At this time, the first and second plates 10 and 20 are stably rotated while being guided along the guide slot 14 by the guide projection 24 and are prevented from being rotated beyond the predetermined angle by the presence of the engagement piece 26.

[0048] Thereafter, the rope 50 is fitted between the first and second plates 10 and 20 such that it is placed in the first rope groove 11 of the first plate 10 and the second rope groove 21 of the second plate 20.

[0049] The user can place the first and second plates 10 and 20 at a desired position on the rope 50 by manipulating the operation cord 40.

[0050] Thereupon, when releasing the operation cord 40, which is pulled upwards, the first and second plates 10 and 20, which are widened to define the predetermined angle therebetween, are rotated in opposite directions by the mass of the weights 15 and 25 which are respectively mounted to the first and second plates 10 and 20, to be pressed against the rope 50 in the first and second rope grooves 11 and 21. At this time, as the position-fixing protuberances 11a and 21a, which are formed on the edges of the first and second rope grooves 11 and 21, are driven into and fastened to the rope 50, the first and second plates 10 and 20 are firmly fixed to the rope 50, whereby the rat guard is prevented from moving along the rope 50.

[0051] As the engagement tab 16, which is formed on the right end of the first plate 10, is engaged with the left end of the second plate 20, the first and second plates 10 and 20 are prevented from being rotated further, and are fixedly held on the rope 50.

[0052] In this way, as the first and second plates 10 and 20 are widened to define the predetermined angle therebetween through the manipulation of the operation cord 40, the rope 50 can be placed between the first and second rope grooves 11 and 21.

[0053] Next, in an effort to prevent rats or the like from boarding a ship through the space defined between the first and second plates 10 and 20, by rotating the first and second plates 10 and 20 in opposite directions, the space is removed. Further, the first and second plates 10 and 20 are firmly fixed to the rope 50 by the position-fixing protuberances 11a and 21a. As a result, it is possible to prevent rats or the like inhabiting a quay from boarding a ship along the rope 50.

[0054] FIG. 5 is a view illustrating the open state of a rat guard for a ship in accordance with a second embodiment of the present invention, and FIG. 6 is a view illustrating the closed state of the rat guard for a ship in accordance with the second embodiment of the present invention.

[0055] Referring to FIGS. 5 and 6, in accordance with a second embodiment of the present invention, a rat guard for a ship, installed on a rope 50 (see FIG. 3) which connects a quay and a ship, to prevent hygiene-threatening animals such as rats, snakes and cats from boarding the ship, is provided. The rat guard according to this embodiment is constructed in the same manner as that of the first embodi-
ment except that the position-fixing protuberances 11a and 21a (see FIG. 3), which are formed in the first and second rope grooves 11 and 21 in the first embodiment, are eliminated, and a washer 60 is additionally installed on the hinge pin 30 (see FIG. 3) of the hinge part.

[0056] In the first and second plates 10 and 20, which are formed to have a semi-circular shape, the first rope groove 11 and the second rope groove 21 are respectively defined on the right end of the first plate 10 and the left end of the second plate 20, which face each other. The rat guard has connection holes 13 and 23, a guide slot 14, a guide projection 24, weights 15 and 25, an engagement piece 26, and an engagement tab 16.

[0057] As described above, in the present embodiment, the position-fixing protuberances 11a and 21a (see FIG. 3), which are formed in the first and second rope grooves 11 and 21 in the first embodiment, are eliminated, and the washer 60 is additionally installed on the hinge pin 30 (see FIG. 3) which is inserted through the hinge holes 12 and 22 and is integrally rotated with the hinge pin 30.

[0058] In the first embodiment, if the rope 50 is not placed simultaneously in the first and second rope grooves 11 and 21, as either one of the position-fixing protuberances 11a and 21a comes into contact with the rope 50, the entire rat guard tends to be inclined toward the other of the position-fixing protuberances 11a and 21a. In the present second embodiment, since the position-fixing protuberances 11a and 21a are eliminated and the washer 60 is installed on the hinge pin 30 which is centrally positioned through the first and second plates 10 and 20, it is possible to prevent the rat guard from being inclined to one side.

[0059] The washer 60 is formed to have a circular configuration. Preferably, the washer 60 is formed as a toothed lock washer having a plurality of protuberances on the outer periphery thereof.

[0060] As the first and second plates 10 and 20 are rotated through manipulation of the operation cord 40 to thus become spaced apart from each other, the rope 50 is fitted into the space defined between the first and second plates 10 and 20. When the rope 50 is placed between the first and second rope grooves 11 and 21 of the first and second plates 10 and 20, the outer periphery of the washer 60 is positioned on the rope 50 and at least one of the protuberances formed on the outer periphery of the washer 60 is driven into the rope 50, by which the first and second plates 10 and 20 are prevented from sliding on the rope 50.

[0061] Then, by rotating the first and second plates 10 and 20 in opposite directions to prevent rats or the like from boarding a ship, the space defined between the first and second plates 10 and 20 is removed. Thereby, since the first and second plates 10 and 20 are firmly fixed to the rope 50 by the washer 60, it is possible to prevent rats or the like inhabiting on a quay from boarding a ship along the rope 50.

[0062] As described above, the rat guard according to the present invention has a simple construction which includes the first plate and the second plate, and is stably placed on and firmly fastened to the rope through manipulation of the operation cord, so that a gap is not produced in the rat guard so as to prevent a rat from boarding a ship.

[0063] As is apparent from the above description, the rat guard for a ship according to the present invention provides advantages in that the rat guard is simply constructed using a first plate and a second plate so as to remove the space through which rats or the like inhabiting a quay can board a ship along a rope.

[0064] Although a preferred embodiment of the present invention has been described for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

What is claimed is:

1. A rat guard for a ship, installed on a rope which connects a quay and a ship, to prevent hygiene-threatening animals, such as rats, snakes and cats, from boarding the ship, the rat guard comprising:

   a. a first plate defined with a first rope groove in a center portion of a right end thereof to be placed on one side of the rope in a lengthwise direction of the rope;

   b. a second plate defined with a second rope groove in a center portion of a left end thereof to be placed on the other side of the rope in the lengthwise direction of the rope;

   and

   a hinge part for hingedly coupling the first and second plates with each other using a hinge pin which is passed through the first and second plates at a position above and spaced apart from the first and second rope grooves by a predetermined distance.

2. The rat guard according to claim 1, wherein respective connection holes are defined through a left upper portion of the first plate and a right upper portion of the second plate, adjacent to outer peripheries of the first and second plates, and an operation cord is connected through the connection holes, so that rotation of the first and second plates can be controlled by moving the operation cord upwards and downwards.

3. The rat guard according to claim 1, wherein a guide projection is formed on one of the first and second plates, which can be rotated around the hinge part, and a guide slot is defined through the other of the first and second plates, so that the guide projection is inserted through and moved along the guide slot to guide rotation of the first and second plates.

4. The rat guard according to claim 1, wherein position-fixing protuberances are projectedly formed on edges of the first and second rope grooves, which face the rope, so that, when the first and second plates are positioned around the rope with the rope extending through the first and second rope grooves, the position-fixing protuberances are driven into the rope to fix an installation position of the rat guard.

5. The rat guard according to claim 1, wherein a washer which has protuberances on an outer surface thereof is driven into the rope extending through the first and second rope grooves.

6. The rat guard according to claim 1, wherein a weight is provided to a lower end of at least one of the first and second plates so that the first and second plates are prevented from being released from the rope by external shock.

7. The rat guard according to claim 1, wherein, in order to prevent the first and second plates from being rotated beyond a predetermined angle, an engagement piece is projectedly formed on the first plate at a position such that
it is engaged with the left end of the second plate to restrain rotation of the second plate or on the second plate at a position such that it is engaged with the right end of the first plate to restrain rotation of the first plate.

8. The rat guard according to claim 1, wherein an engagement tab is formed adjacent to a lower end on the left end or the right end of one of the first and second plates, which is not formed with the engagement piece, to project toward the other of the first and second plates, which is not formed with the engagement tab.