(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
25 March 2010 (25.03.2010)

PCT

(10) International Publication Number
WO 2010/033026 A1

(51) International Patent Classification:
B63B 19/00 (2006.01) *B63B 19/24* (2006.01)
B63B 19/14 (2006.01) *B63B 43/32* (2006.01)

(21) International Application Number:
PCT/NL2009/050561

(22) International Filing Date:
18 September 2009 (18.09.2009)

(25) Filing Language: Dutch

(26) Publication Language: English

(30) Priority Data:
2001996 19 September 2008 (19.09.2008) NL

(71) Applicant *(for all designated States except US)*: **NEWTHEX NED. B.V.** [NL/NL]; Molenraai 11, NL-9611 TH Sappemeer (NL).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: **DE ROVER, Jan** [NL/NL]; Vechtlaan 13, NL-9606 RJ Kropswolde (NL).

(74) Agent: **HATZMANN, M.J.**; Vereenigde, Johan de Wittlaan 7, NL-2517 JR Den Haag (NL).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

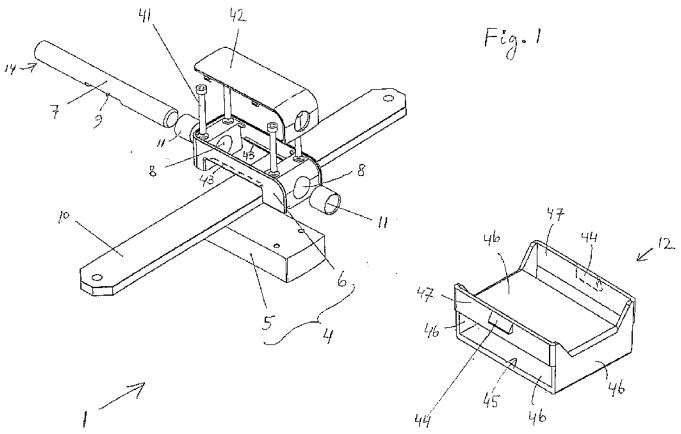
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

WO 2010/033026 A1

(54) Title: LOCKING ELEMENT AND LOCKING SYSTEM FOR A SHIP'S DOOR, SHIP'S WINDOW OR SHIP'S HATCH



(57) Abstract: A locking element (1) for locking a ship's door comprises a body (4) and a locking bolt (7). The body comprises at least one bolt passage (8) for therein receiving the bolt, such that the bolt is movable back and forth therein in its axial bolt direction between a locking position and an unlocking position. The bolt is provided with rod guide means (9) for therein receiving a rod (10), such that the rod is therein movable back and forth in its axial rod direction, the axial rod direction being at right angles to or otherwise crossing with respect to the axial bolt direction. The body and the bolt are configured such that the rod, if it is received in the rod guide means in the manner mentioned and when it is moved with at least a movement component in the axial bolt direction, causes the bolt to move in the axial bolt direction for changing between the locking position and unlocking position mentioned.

Title: Locking element and locking system for a ship's door, ship's window or ship's hatch

The invention relates to a locking element for, in a fastening condition of the element fastened to a ship's door, ship's window or ship's hatch, locking the door, the window or the hatch with respect to a boundary, such as a frame, with respect to which the door, the window or the hatch is hingedly suspended. More particularly, the invention relates to a locking element for a weather-tight and/or water-tight ship's door, weather-tight and/or water-tight ship's window, or weather-tight and/or water-tight ship's hatch. The invention further relates to a locking system for a weather-tight and/or water-tight ship's door, weather-tight and/or water-tight ship's window, or weather-tight and/or water-tight ship's hatch.

It is noted that in this text, for brevity, often the terms "ship's door" or "door" are used. In these cases, however, it is to be understood that these terms are also intended to mean a ship's window or a ship's hatch. It is further noted that in this text the terms "(ship's) door", "(ship's) window" or "(ship's) hatch" are understood to mean doors, windows or hatches of various kinds of vessels and other maritime objects, among which, for instance, offshore structures.

Known elements of this kind that are used in known systems of this kind are (door) clamps, also called (door) clips, which are fastened near the edge of a door, on the side of the door facing away from the direction in which the door turns open. Such a known clamp comprises an assembly of a lever extending in a particular direction and a locking plate extending in another direction, the lever and the locking plate being immovable relative to each other. This assembly of lever and locking plate is pivotable about a pivot whose position with respect to the door is fixed. By rotating the lever about the pivot, the locking plate can be pivoted from an unlocking position into a locking position, and vice versa. In the locking position, the locking plate clamps

against a portion of a boundary with respect to which the door is hingedly suspended.

It is also known to use several of such known door clamps in a single locking system for a door, in which system the respective levers of the separate door clamps are mutually connected by means of a rod assembly, such that a user can operate all door clamps of the door simultaneously by means of a single operating handle which is connected with the rod assembly.

A drawback of the known door clamps and the locking systems based thereon is that the system is not very compact. For instance, the clamps require a relatively large pivoting range of their levers and locking plates, which pivoting range projects both on the face of the door and on the boundary of the door. The rod assemblies which are in connection with the levers of the clamps are not very compact either, and moreover are complex. Further, the levers are subject to operating forces applied thereto, which forces are not always directed equally favorably, which is not beneficial to the life span of the pivoting mechanism of the clamps. Replacement of parts, such as the clamps, of these known locking systems during maintenance is not always equally simple, *inter alia* because of hinging joints between clamp levers and rod assemblies. Furthermore, it is not uncommon for users to sustain (serious) injury from the locking plates of the clamps pivoting forcefully into the locking position.

It is an object of the invention to provide at least an alternative locking solution for (weather-tight and/or water-tight) ship's doors, which solution offers improvements in respect of aspects such as compactness and/or simplicity and/or maintenance and/or safety.

To this end, according to the invention, a locking element according to claim 1 is provided. Specific embodiments of the invention are laid down in the dependent claims.

According to the invention, therefore, there is provided a locking element for, in a fastening condition of the element fastened to a ship's door,

ship's window or ship's hatch, locking the door, the window or the hatch with respect to a boundary with respect to which the door, the window or the hatch is hingedly suspended, which locking element comprises a body and a locking bolt, which body comprises at least one bolt passage for therein receiving the bolt, such that the bolt is therein movable back and forth in its axial bolt direction between at least one locking position and at least one unlocking position, which bolt is provided with rod guide means for therein receiving a rod, such that the rod is therein movable back and forth in its axial rod direction, the axial rod direction being at right angles to or otherwise crossing with respect to the axial bolt direction, and wherein the body and the bolt are configured such that the rod, if it is received in the rod guide means in said manner and when it is moved with at least a movement component in the axial bolt direction, causes the bolt to move in the axial bolt direction for changing between the at least one locking position and the at least one unlocking position of the bolt.

The body and the bolt can each be made of diverse materials, such as, for instance, a metal or metal alloy, for instance stainless steel.

Such a locking element offers compactness, not only because the body and the bolt are compact, but also because of the relatively small (back-and-forth) sliding range of the locking bolt in the axial bolt direction. Here, not only the sliding range of the bolt projected on the door surface, but also the sliding range of the bolt projected on the door boundary is compact. Furthermore, operating the movement of the bolt is simple because this is simply done by the rod moving with a movement component in the axial bolt direction. As the rod is slidable with respect to the rod guide means, no complex fastenings are present between the bolt and the rod. Furthermore, the bolt being movable back and forth offers a lower risk of injury than a pivoting locking plate of a clamp. In the locking element, the bolt and the rod only perform relative sliding movements, so that, in principle, the locking element does not require lubrication and in that sense is hence free of maintenance.

The absence of relatively fragile rotary mechanisms renders the locking element robust and extremely durable.

Preferably, the locking element furthermore comprises at least one bolt bearing element which in operation is at least partly received in at least a part of the at least one bolt passage for bearing-supporting the back-and-forth movement of the bolt in the at least one bolt passage. When the body and the bolt are for instance made of metal, the bolt bearing element may for instance be a plastic casing for the bolt, fixed in the bolt passage, in which casing the bolt can move back and forth.

Preferably, the locking element furthermore comprises a rod bearing element which in operation is at least partly received in at least a part of the rod guide means for bearing-supporting the back-and-forth movement of the rod in the rod guide means. When the rod guide means and the rod are for instance made of metal, the rod bearing element can for instance be a plastic casing for the rod, placed in the rod guide means, in which casing the rod can move back and forth. In connection with the occurring transfer forces between rod and bolt, it is advantageous when the rod bearing element is manufactured from, for instance, a fiber-reinforced plastic.

It is noted that if the bolt bearing element and/or the rod bearing element are manufactured from plastic, and were to be lost in case of fire, such loss does not affect the primary working of the locking element. This is to say that when these elements are lost, a locking position or unlocking position of the bolt, once assumed, is maintained and it remains possible to change between these positions.

Various kinds of rod guide means can be used with the bolt. For instance, this may be local protrusions of the bolt. In an advantageous embodiment, the rod guide means are formed by a recess in the bolt. Such a recess is simple to manufacture and contributes to the compactness of the locking element.

Preferably, the bolt at its one end comprises a bevel extending in the axial bolt direction for therewith, in the fastening condition in the at least one locking position, clampingly engaging with respect to the boundary with respect to which the door, the window or the hatch is hingedly suspended. Such a bevel promotes an advantageous clamping action of the bolt with respect to this boundary. Also, to the boundary there may be fastened, for instance, special counter elements for the bolt end, which counter elements also have a bevel, which is tailored to the bevel of the bolt. Such counter elements are in principle exchangeable with other such counter elements or may for instance be adjustable as to shape or orientation, so that for instance the angle of bevel, height of bevel and the like, of the counter-element can be varied.

In an advantageous embodiment, the body of the locking element comprises a first part and a second part, wherein the first part is configured to be directly fastened to the door, the window or the hatch, and wherein the second part is configured to be fastened detachably, as for instance through screwing, to the first part, such that after detachment of the second part, at least the bolt is removable with respect to the first part. Such an embodiment offers for instance the advantages that the locking element can be simply mounted and that once a locking element has been mounted, parts thereof can be simply mounted and demounted. In such an embodiment, the first part is preferably configured to be fastened undetachably, as for instance through welding, to the door, the window or the hatch. This promotes ease of assembly and disassembly still further, since the first part upon first assembly in principle never needs to be removed from the door again.

The invention is further embodied in a locking system comprising at least one locking element according to the invention, at least one said rod, and manually movable or motor-movable operating means for operatively moving the at least one rod with at least said movement component in the axial bolt direction. From the above, it appears that in operation the freedom of

movement of the at least one rod with respect to the door is limited by the rod guide means. Preferably, a locking system according to the invention comprises additional restriction means for, in operation, additionally limiting the freedom of movement of the at least one rod with respect to the door, the window or the hatch. With the aid of these additional restriction means, the operating means can be prevented from possibly moving the at least one rod in an undesired direction and regulation is enabled of the operating means moving the at least one rod in a desired direction.

Preferably, the additional restriction means comprise at least one hinging element, which hinging element in operation is hingedly connected at a first point of the hinging element to the door, the window or the hatch and in operation is further hingedly connected at another, second point of the hinging element to the at least one rod. Such a hinging element limits the freedom of movement of the rod, such that the point of the rod that is connected to the second point of the hinging element can only move along a circular arc path whose center of rotation is formed by the first point where the hinging element is hingedly connected to the door. Such a circular arc path is particularly suitable for regulating movements of the rod with movement components in the axial rod direction and in the axial bolt direction.

Preferably, the operating means comprise a manually operable handle which in operation is hingedly connected at a point of the handle to the door, the window or the hatch and which in operation is further hingedly connected at another point of the handle to the at least one rod. Such a hinging element limits the freedom of movement of the rod, such that the point of the rod that is connected to the other point of the handle can only move along a circular arc path whose center of rotation is formed by the one point where the handle is hingedly connected to the door. Such a circular arc path is particularly suitable for regulating movements of the rod with movement components in the axial rod direction and in the axial bolt direction.

In an advantageous embodiment, the locking system comprises at least two such locking elements, wherein, for at least one of the at least one rod, this one rod in operation is received in the above-mentioned manner in separate rod guide means of associated separate ones of the at least two locking elements. Thus, a single rod can operate several separate locking elements simultaneously.

In an advantageous embodiment, the locking system comprises at least two such locking elements and at least two such rods, wherein, for at least one couple of the at least two rods, the two separate rods of this couple in operation are received in the above-mentioned manner in separate rod guide means of associated separate ones of the at least two locking elements, and wherein in operation the two separate rods are mutually coupled by a hinging element as mentioned above, which hinging element in operation is hingedly connected at the second point of the hinging element to one of the two separate rods and which hinging element in operation is hingedly connected at a third point, other than the first point and the second point, of the hinging element to the other of the two separate rods. Thus, two rods can be mutually coupled by such a hinging element, the hinging element thereby limiting the freedom of movement of each of the two rods along a separate circular arc path whose center of rotation is formed by the first point where the hinging element is hingedly connected to the door. Such circular arc paths are particularly suitable for regulating coupled movements of each of the two rods with movement components in the respective axial rod and bolt directions associated with the rods.

The invention is further embodied in a ship's door, ship's window or ship's hatch as mentioned, and comprising a locking element as mentioned and/or a locking system as mentioned.

Furthermore, the invention is embodied in an assembly comprising a ship's door, ship's window or ship's hatch as mentioned and the boundary

mentioned with respect to which the door, the window or the hatch is hingedly suspended.

In the following, the invention is further elucidated with reference to the schematic figures in the appended drawing.

Fig. 1 shows in perspective an example of an embodiment of a locking element according to the invention in a disassembled condition.

Fig. 2 shows a part of the locking element shown in Fig. 1 in median longitudinal section.

Fig. 3 shows, in front view, an example of a weather-tight and/or water-tight ship's door provided with a locking system comprising several locking elements as shown in Figs. 1 and 2.

In the Figures, a locking element 1 according to the invention is shown. In Figs. 1 and 2, the element 1 is shown in detail, while Fig. 3 shows several such elements 1 in a fastening condition fastened to a ship's door 2 for locking the door 2 with respect to a boundary 3 with respect to which the door is hingedly suspended. In Fig. 3, the elements 1 are fastened near a number of edges of the door 2 on the side of the door 2 facing away from the direction in which the door swings open. With broken lines, door hinges 40 are shown in transparent view.

The locking element 1 comprises a body 4 and a locking bolt 7. The body 4 comprises at least one bolt passage 8 for therein receiving the bolt 7, such that the bolt 7 is therein movable back and forth in its axial bolt direction between at least one locking position (shown in Fig. 3) and at least one unlocking position. In the example shown, the body 4 comprises two such bolt passages 8, each having a cylindrical shape, which are spaced apart and are in line with each other, while the body 4 between these two bolt passages 8 comprises a recess. The bolt 7 is provided with rod guide means 9 for therein receiving a rod 10, such that the rod is therein movable back and forth in its axial rod direction, the axial rod direction being at right angles to the axial bolt direction. In the example shown, the rod guide means 9 are formed by a

recess 9 in the bolt 7. The body 4 and the bolt 7 are configured such that the rod 10, if received in the recess 9 in the manner mentioned and when moved with at least a movement component in the axial bolt direction, causes the bolt 7 to move in the axial bolt direction for changing between the at least one locking position and the at least one unlocking position of the bolt 7.

The locking element 1 further comprises two bolt bearing elements 11, of which one is operatively received in one bolt passage 8 and of which the other is operatively received in the other bolt passage 8 for bearing-supporting the above-mentioned back-and-forth movement of the bolt 7 in the two bolt passages.

The locking element 1 further comprises a rod bearing element 12 which is operatively received in the recess 9 of the bolt 7 for bearing-supporting the back-and-forth movement of the rod 10 in the recess 9. The rod bearing element 12 is shown in Fig. 1 and may for instance be manufactured from a plastic, which may or may not be fiber-reinforced. In the example, the rod bearing element 12 is a plastic casing for the rod 10, placed in the recess 9 of the bolt 7, in which casing the rod can move back and forth. This casing is formed by the four mutually adjoining rectangular walls 46 shown, which define an encased slide-through space 45 for the rod 10. The casing has two upstanding walls 47 which each have a projection 44. In assembled condition of the element 1, the rod bearing element 12 is placed in the earlier-mentioned recess of the body 4 which is between the two bolt passages 8, with the projections 44 resting on the ribs 43 shown of the body 44. In that assembled condition the casing wall 46 shown at the top in Fig. 1 is placed in the recess 9 of the bolt 7 when this bolt 7 is placed in the passages 8. Thus, the rod bearing element 12 is confined between, on one side, the ribs 43 of the body 4 and, on the other side, the bolt 7.

In Fig. 2 it is shown that the bolt 7 at its one end comprises a bevel 14 extending in the axial bolt direction for therewith, in the fastening

condition in the at least one locking position, clampingly engaging with respect to the boundary 3 with respect to which the door 2 is hingedly suspended.

In the example, the body 4 comprises a first part 5 and a second part 6, the first part 5 being configured to be directly fastened to the door 2, and the second part 6 being configured to be fastened detachably, as for instance by means of the screws 41 shown, to the first part 5, such that after detachment of the second part 6 at least the bolt 7 is removable with respect to the first part 5. The first part 5 may be configured to be fastened undetachably, as for instance by means of welding, to the door 2.

In Figs. 1 and 2, furthermore, a detachable guard 42 is shown, which in the example can be snapped onto the second part 6 of the body 4.

In Fig. 3 a locking system is shown which comprises multiple locking elements 1, three rods 10, 110, 210, and manually movable operating means 15 for operatively moving the rods with at least the movement component in the axial bolt direction. The rod 10 is received in two separate rod guide means of associated separate locking elements 1. The rods 110 and 210 are each received in rod guide means of a single locking element 1.

The three rods shown are mutually coupled by additional restriction means 16, 17 for, in operation, additionally restricting the freedom of movement of the rods 10, 110, 210 with respect to the door 2. In the example, these additional restriction means are formed by hinging elements 16, 17. Each of these elements 16 and 17, respectively, in operation is hingedly connected at a first point 18, and 28, respectively, of the hinging element to the door 2 and in operation is further hingedly connected at another, second point 19 and 29, respectively, of the hinging element to one of the rods.

A difference between the depicted hinging elements 16 on one side and the depicted hinging elements 17 on the other is that the hinging element 16 in operation is further hingedly connected at a third point 20, other than the first point 18 and other than the second point 19, of the hinging element 16 to another rod 110, 210.

In the example, the operating means 15 comprise a manually operable handle 15 which in operation is hingedly connected at a point 38 of the handle to the door 2 and which in operation is further hingedly connected at another point 39 of the handle 15 to the rod 10. The rod 10 is coupled via the hinging elements 16, 17 to the rods 110 and 210. In the situation shown, the bolts 7 of the locking elements 1 shown are each in locking position. By pivoting the handle 15 about the pivot point 38 in the direction of the arrow 50 shown, the mutually coupled rods 10, 110 and 210 are each moved over circular arc paths, such that all bolts 7 of the locking elements 1 shown pass into the unlocking position, which transition is indicated with the arrows 51 shown.

It is noted that the above-mentioned examples of embodiments do not limit the invention and that within the scope of the appended claims various alternatives are possible. Thus, the locking bolt and the rod can have various cross-sectional shapes. For instance, the perimeter of such a cross section can have a curved shape, such as a circular, elliptical shape or the like, but also a piecewise straight shape, such as for instance a rectangular shape or the like. Also, that perimeter can have a shape combining such curved and piecewise straight shapes. Furthermore, the operating means of locking systems of multiple doors may be centrally controlled. Other variants or modifications, however, are also possible. These and similar alternatives are understood to be within the framework of the invention as defined in the appended claims.

CLAIMS

1. A locking element for, in a fastening condition of the element (1) fastened to a ship's door (2), ship's window or ship's hatch, locking the door, the window or the hatch with respect to a boundary (3) with respect to which the door, the window or the hatch is hingedly suspended, which locking element (1) comprises a body (4) and a locking bolt (7), which body comprises at least one bolt passage (8) for therein receiving the bolt, such that the bolt is therein movable back and forth in its axial bolt direction between at least one locking position and at least one unlocking position, which bolt is provided with rod guide means (9) for therein receiving a rod (10), such that the rod is therein movable back and forth in its axial rod direction, the axial rod direction being at right angles to or otherwise crossing with respect to the axial bolt direction, and wherein the body and the bolt are configured such that the rod, if it is received in the rod guide means in said manner and when it is moved with at least a movement component in the axial bolt direction, causes the bolt to move in the axial bolt direction for changing between said at least one locking position and said at least one unlocking position of the bolt.

2. A locking element according to claim 1, further comprising at least one bolt bearing element (11) which in operation is at least partly received in at least a part of the at least one bolt passage (8) for bearing-supporting said back-and-forth movement of the bolt (7) in the at least one bolt passage.

3. A locking element according to claim 1 or 2, further comprising a rod bearing element (12) which in operation is at least partly received in at least a part of the rod guide means (9) for bearing-supporting said back-and-forth movement of the rod (10) in the rod guide means.

4. A locking element according to any one of the preceding claims, wherein the rod guide means (9) are formed by a recess (9) in the bolt (7).

5. A locking element according to any one of the preceding claims, wherein the bolt (7) at its one end comprises a bevel (14) extending in the axial bolt direction for therewith, in the fastening condition in the at least one locking position, clampingly engaging with respect to the boundary (3) with respect to which the door (2), the window or the hatch is hingedly suspended.

6. A locking element according to any one of the preceding claims, wherein the body (4) comprises a first part (5) and a second part (6), wherein the first part is configured to be directly fastened to the door (2), the window or the hatch, and wherein the second part is configured to be fastened detachably, as for instance through screwing, to the first part, such that after detachment of the second part, at least the bolt (7) is removable with respect to the first part.

7. A locking element according to claim 6, wherein the first part (5) is configured to be fastened undetachably, as for instance through welding, to the door (2), the window or the hatch.

8. A locking system comprising at least one locking element (1) according to any one of the preceding claims, at least one said rod (10, 110, 210), and manually movable or motor-movable operating means (15) for operatively moving the at least one rod with at least said movement component in the axial bolt direction.

9. A locking system according to claim 8, further comprising additional restriction means (16, 17) for, in operation, additionally limiting the freedom of

movement of the at least one rod (10, 110, 210) with respect to the door (2), the window or the hatch.

10. A locking system according to claim 9, wherein the additional restriction means comprise at least one hinging element (16; 17), which hinging element in operation is hingedly connected at a first point (18; 28) of the hinging element to the door (2), the window or the hatch, and in operation is further hingedly connected at another, second point (19; 29) of the hinging element to the at least one rod (10; 110; 210).

11. A locking system according to any one of claims 8 to 10, wherein the operating means (15) comprise a manually operable handle (15) which in operation is hingedly connected at a point (38) of the handle to the door (2), the window or the hatch, and which in operation is further hingedly connected at another point (39) of the handle to the at least one rod (10).

12. A locking system according to any one of claims 8 to 11, comprising at least two such locking elements (1), wherein, for at least one of the at least one rod, this one rod (10) in operation is received in said manner in separate rod guide means (9) of associated separate ones of the at least two locking elements (1).

13. A locking system according to any one of claims 8 to 12, comprising at least two such locking elements (1) and comprising at least two such rods (10, 110, 210), wherein, for at least one couple of the at least two rods, the two separate rods of this couple in operation are received in said manner in separate rod guide means (9) of associated separate ones of the at least two locking elements, and wherein in operation the two separate rods are mutually coupled by a hinging element (16) as mentioned in claim 10, which hinging element in operation is hingedly connected at the second point (19) of the

hinging element to one (10) of the two separate rods and which hinging element in operation is hingedly connected at a third point (20), other than said first point (18) and said second point (19), of the hinging element (16) to the other (110, 210) of the two separate rods.

14. A ship's door, ship's window or ship's hatch as mentioned in any one of the preceding claims and comprising a locking element (1) according to any one of claims 1 to 7 and/or a locking system according to any one of claims 8 to 13.

15. An assembly comprising a ship's door (2), ship's window or ship's hatch according to claim 14, as well as said boundary (3) with respect to which the door, the window or the hatch is hingedly suspended.

Fig. 1

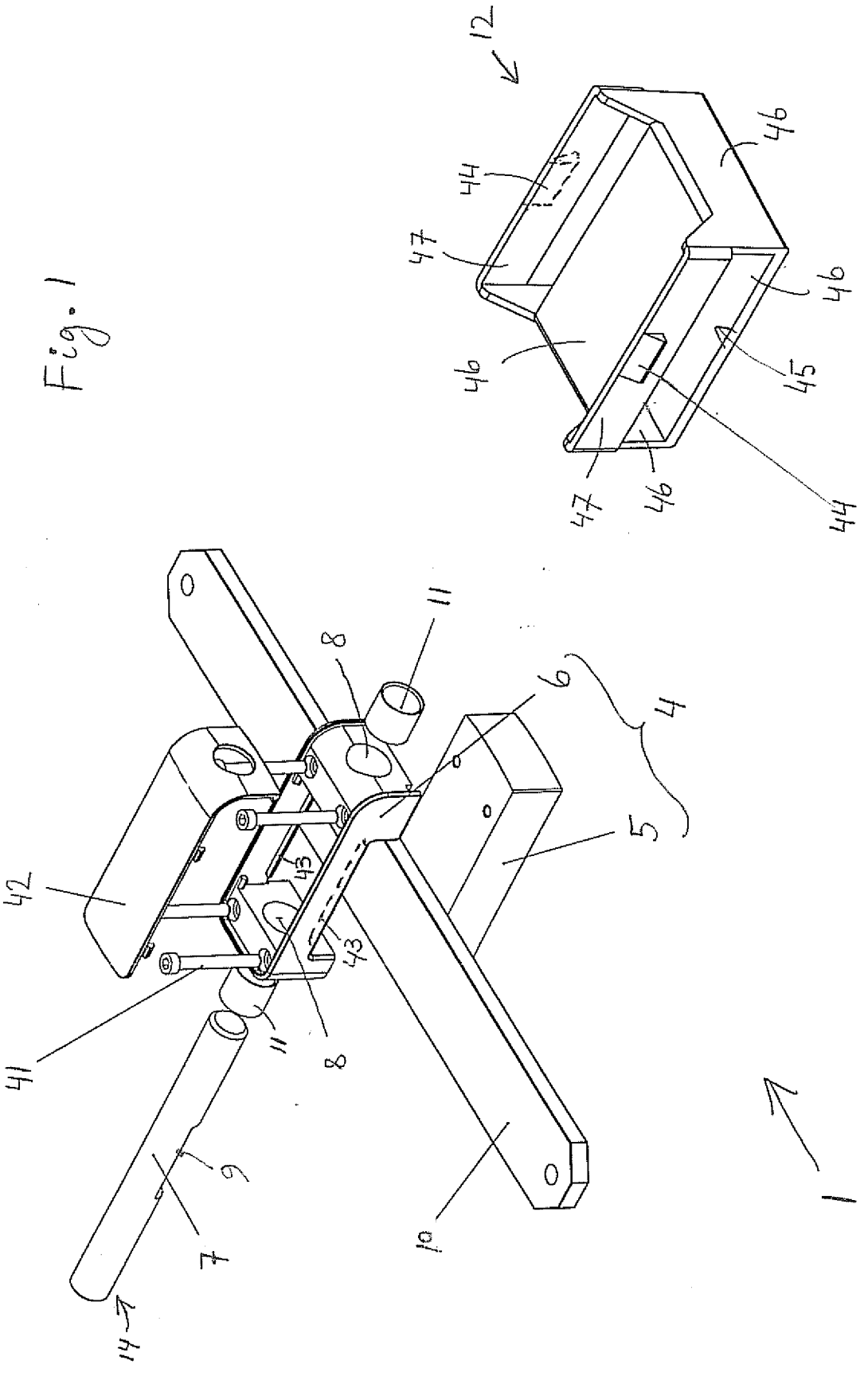


Fig. 2

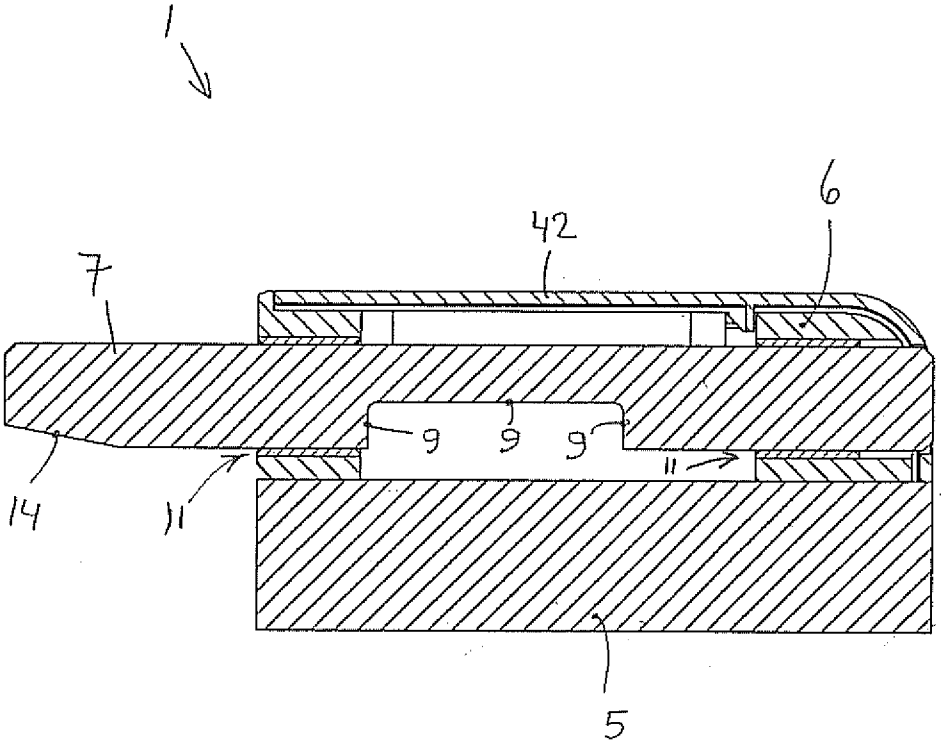
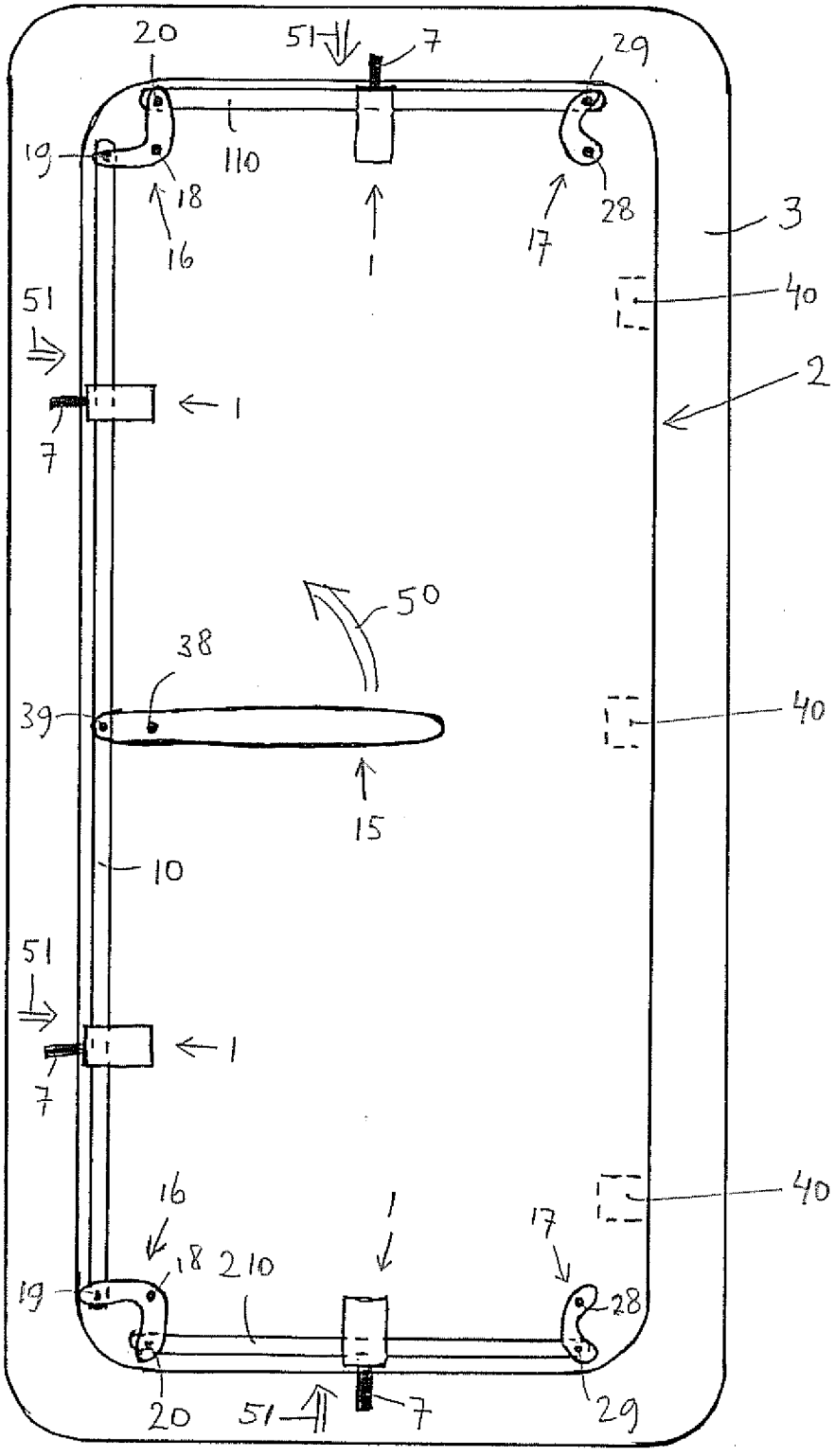


Fig. 3


20
51
7
29
19
110
18
16
1
17
28
3
40
51
1
2
7
50
38
39
40
15
10
51
1
7
16
18
210
1
17
19
28
20
51
7
29

INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2009/050561

A. CLASSIFICATION OF SUBJECT MATTER
INV. B63B19/00 B63B19/14 B63B19/24 B63B43/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2007/022662 A1 (RISING BENJAMIN E [US] ET AL) 1 February 2007 (2007-02-01) figures 3-5	1,8, 14-15
A	US 6 446 393 B1 (MARSTON SR MATTHEW JAY [US] ET AL) 10 September 2002 (2002-09-10) figures 1-7	1,8, 14-15
A	US 6 123 370 A (ROZEMA TIMOTHY S [US] ET AL) 26 September 2000 (2000-09-26) figures 1-5	1,8, 14-15
A	EP 0 911 469 A (IND DU PONANT SA L [FR]) 28 April 1999 (1999-04-28) figures	1,8, 14-15

[ ] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 December 2009	29/12/2009

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	van Rooij, Michael

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/NL2009/050561

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007022662 A1	01-02-2007	NONE	
US 6446393 B1	10-09-2002	NONE	
US 6123370 A	26-09-2000	NONE	
EP 0911469 A	28-04-1999	AT 221947 T	15-08-2002
		CA 2261365 A1	09-08-2000
		DE 69807024 D1	12-09-2002
		DE 69807024 T2	15-05-2003
		ES 2178134 T3	16-12-2002
		FR 2770251 A1	30-04-1999
		PT 911469 E	29-11-2002
		US 6101764 A	15-08-2000