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(54) **A RETRACTABLE TELESCOPIC GANGWAY FOR A FLOATING NAVIGATION UNIT**

(57) A retractable telescopic gangway (1) for a floating navigation unit (100), defining an upper gangway walkway plane (5), and adapted to allow the transit of an individual entering, or exiting, said floating navigation unit (100), transiting on said upper gangway walkway plane (5), wherein said retractable telescopic gangway (1) comprises at least two gangway elements (10, 20) telescopically engaged with respect to one another along a gangway axis (P-P) parallel to said walkway surface between a minimum gangway length (L1) and a maximum gangway length (L2); said at least two gangway elements (10, 20), telescopically engaged with one another, comprising a proximal end element (10) adapted to be fastened to said floating navigation unit (100), and one opposite distal end element (20); telescopic actuation means (9) for moving said at least two gangway elements (10, 20) with respect to one another along the gangway axis between

said minimum gangway length (L1) and said maximum gangway length (L2); a terminal element (40) having an elongated shape defining a terminal element axis (T-T) along a main development direction thereof, said terminal element (40) being rotatably engaged with said distal end element (20) about a hinge axis (C-C) parallel to the gangway walkway plane (5) and orthogonal to the gangway axis (P-P) and to the terminal element axis (T-T), in a manner adjustable between an rest angular position, in which the terminal element (40) is superimposed on the distal end element (20), and an operative position, in which the terminal element (40) is angularly spaced with respect to the distal end element (20), between a maximum upward inclination position and a maximum downward inclination position; rotary actuation means (60) for rotating said terminal element (40) with respect to said distal end element (20).

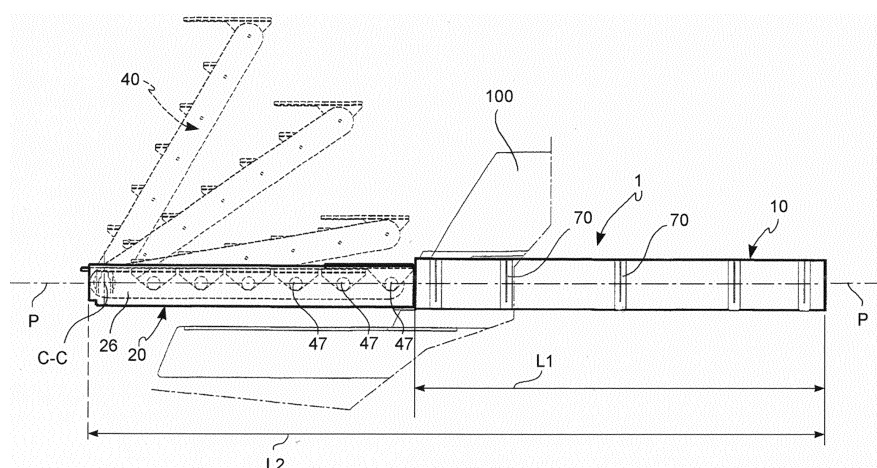


FIG. 6

Description

Field of the invention

[0001] The present invention relates to a telescopic gangway for a floating navigation unit, capable of allowing the comfortable use thereof even in the case in which the gangway walkway surface is substantially misaligned with respect to a dock plane, and also in the case in which a user wishes to comfortably move from the gangway walkway surface to an immersion position and vice versa.

Background art

[0002] Telescopic gangways are well known in the nautical field.

[0003] The telescopic gangways comprise at least two elements telescopically engaged in translation to one another, between a closed configuration which corresponds to a minimum length, and an open position which corresponds to a maximum length.

[0004] In the open position, the telescopic gangways protrude in a cantilever manner, with respect to the hull of the floating navigation unit, while in the closed position they are generally withdrawn inside the hull and are hidden from view.

[0005] The telescopic gangways define a walkway surface, which is a plane adapted to be treaded on by an individual who walks along the gangway.

[0006] The gangway, therefore, is used to allow the passage of an individual from the floating navigation unit to the dock and vice versa.

[0007] In order to adapt the gangway to a dock plane which is vertically displaced with respect to a connection point of the gangway with respect to the hull, rotating the entire gangway is known, when it is in the open position, along a vertical plane, about a horizontal axis, transversal to a telescopic lengthening axis of the gangway.

[0008] This rotation, however, varies the slope of the walkway surface, therefore it may only be restricted within a rather limited angle with respect to a horizontal plane, to allow a user to walk on it safely.

[0009] Therefore, the known telescopic gangways do not allow a user to pass on them when the difference in height between the connection point of the gangway to the hull and the dock plane is significant.

[0010] Furthermore, the known telescopic gangways, even if they may rotate at a predetermined angle with respect to a horizontal plane, do not in any way allow a user who is in the water to access on board the floating navigation unit by passing, or walking on the gangway.

[0011] Similarly, such known telescopic gangways do not allow the user to comfortably dive simply by walking on the walkway surface of the gangway itself.

[0012] Moving platforms are also known which allow to move part of a stern platform of the floating navigation unit up to an upper or lower level with respect to a resting position. However, even if moving the platform, they do

not allow to form, at the same time, a continuous treadable plane from the hull of the floating navigation unit to the dock plane, easily used by a user, simply by walking.

[0013] Among other things, such known movable platforms often have articulated structures, which are mechanically complex, which require actuators of great power and size, and which are therefore quite heavy.

[0014] Furthermore, such known movable platforms require redesigning the stern platform of the floating navigation unit, both structurally and aesthetically. In fact, a compartment must be obtained inside the stern platform, housing an additional mechanical and hydraulic apparatus to move the platform itself.

[0015] The structure itself of the floating navigation unit must be reinforced and redesigned, to support the considerable loads generated by the own weight of the movable structure and of the bulky handling machinery, but also to counteract the high moment value of the forces generated by the significant weight of the platform and by a significant arm value of the applied forces.

[0016] The need is therefore felt to provide a telescopic gangway capable of forming a continuous walkway between a connection point of the gangway to the floating navigation unit and a free end of the gangway, even if the difference in height between the connection point of the gangway and the level of the dock is significant, avoiding that said walkway has a significant slope.

[0017] The need is also felt that the assembly of such gangway to the floating navigation unit does not require any structural or aesthetic modification to the floating navigation unit, with respect to the assembly of a conventional gangway.

Summary of the invention

[0018] It is the object of the present invention to devise and provide a gangway for a floating navigation unit, which allows to meet the aforesaid requirements and to at least partially overcome the drawbacks complained above with reference to the background art.

[0019] In particular, it is the object of the present invention to provide a telescopic gangway for a floating navigation unit which allows to form a continuous walkway between a connection point of the gangway to the floating navigation unit and a free end of the gangway, even if the difference in height between the connection point of the gangway and the level of the dock is high, avoiding that said walkway has a significant slope.

[0020] It is another object of the present invention to provide a telescopic gangway for a floating navigation unit which allows a user to move from the floating navigation unit to a dock plane even in the case in which the difference in height between the connection point of the gangway and the level of the dock is significant, thus avoiding said gangway requiring cumbersome and heavy movement actuation apparatuses.

[0021] It is another object of the present invention to provide a telescopic gangway for a floating navigation

unit which allows a user to have an easy access from the sea to the floating navigation unit and from the floating navigation unit to the sea, along said gangway.

[0022] Furthermore, it is an object of the present invention to provide a telescopic gangway for a floating navigation unit capable of allowing the assembly of such gangway to the floating navigation unit, thus avoiding requiring any structural or aesthetic modification to the floating navigation unit, with respect to the assembly of a conventional gangway.

[0023] It is a further object of the present invention to provide a telescopic gangway for a floating navigation unit capable of being replaced by a conventional gangway of a pre-existing floating navigation unit, thus avoiding making any aesthetic and/or structural modification to such floating navigation unit.

[0024] These and further objects and advantages are achieved by a telescopic gangway for a floating navigation unit, as well as by a floating navigation unit comprising said telescopic gangway, in accordance with the independent claims.

[0025] Further objects, solutions and advantages are present in the embodiments described below and claimed in the dependent claims.

Brief description of the drawings

[0026] The invention will be shown below with the description of some embodiments thereof, given by way of non-limiting example, with reference to the accompanying drawings in which:

- Figure 1 shows a partial perspective view of a floating navigation unit comprising a gangway according to the invention in which the terminal element is still in the closed position in the distal end element;
- Figure 2 shows the perspective view in Figure 1, in which the terminal element is in an open position and inclined downwards, and partially submerged, so as to facilitate the ascent of a swimmer on board;
- Figure 3 shows a side view of a gangway according to the invention in a minimum gangway length configuration, in which the gangway elements are all stored within the space of the proximal gangway element;
- Figure 4 shows a side partially sectional view of the gangway in Figure 4, associated with an internal housing in a floating navigation unit so that, in the minimum length position, the gangway completely falls within the space of the floating navigation unit and so that such gangway may extend protruding externally with respect to the floating navigation unit, through an opening of the housing, in which the proximal element is fixed in the housing, in which the gangway is shown in a configuration of minimum length, and a door for closing the opening is shown in the closed position;
- Figure 5 shows the gangway in Figure 4, in which

the closing door is open to allow the lengthening of the gangway through the opening;

- Figure 6 shows the gangway in Figure 4, in which the distal end element is extracted and protruding from the floating navigation unit in the maximum gangway length configuration, in which the terminal element, represented with a continuous line, is superimposed and rotated in the space of the distal end element to the element in the closed position, while, the dashed lines indicate successive angular positions in the rotation of the terminal element from the closed angular position towards an operative position, in which the terminal element is angularly spaced with respect to the distal end element;
- Figure 7 shows the gangway in Figure 4, in the maximum telescopic gangway length configuration and with the terminal element of the gangway arranged in an operative position rotated by 180° with respect to the closed position, and with the terminal element axis arranged parallel or coincident with the gangway axis, in which the treadable plane of the terminal element is placed in extension of the treadable plane of the distal end element of the gangway;
- Figure 8 shows a top view of the gangway in Figure 7, in the same configuration in Figure 7;
- Figure 9 shows an isometric view of the gangway in Figure 3 in the minimum gangway length configuration, in which the elements of the telescopic gangway and the terminal element are all inside the proximal end element of the gangway;
- Figure 10 shows an isometric view of the gangway in Figure 10, in which the telescopic gangway is in the maximum gangway length configuration, in which the terminal element is in the closed angular position, housed in the distal end element with the terminal element axis arranged parallel or coinciding with the gangway axis;
- Figure 11 shows an isometric view of the gangway in Figure 10, in which the terminal element is in a position angularly spaced from the closed position, towards a terminal element operative position;
- Figure 12 shows an isometric view of the gangway in Figure 10, in which the terminal element is in another position angularly spaced from the closed position, towards a terminal element operative position;
- Figure 13 shows an isometric view of the gangway in Figure 10, in which the terminal element is in an operative angular position, and is inclined upwards with respect to the walkway surface of the gangway, and in which a housing compartment in the distal end element, to house the terminal element when it is in the closed position, is closed by a sliding closing plate, which forms part of the walkway surface of the telescopic gangway;
- Figure 14 shows an isometric view of the gangway in Figure 13, in which the terminal element is in an operative position aligned with the gangway axis forming a plane walkway surface in continuation of

the walkway surface of the distal end element of the gangway, and in which a housing compartment in the distal end element, to house the terminal element when it is in the closed position, is closed by a sliding closing plate;

- Figure 15 shows an isometric view of the gangway in Figure 13, in which the terminal element is in an operative angular position inclined downwards with respect to the walkway surface of the gangway, and in which a housing compartment in the distal end element, to house the terminal element when it is in the closed position, is closed by a sliding closing plate, which forms part of the walkway surface of the telescopic gangway;
- Figure 16 shows a partial isometric view of the gangway according to the invention, in which the distal end element is in an extended position at the maximum gangway length, and in which one of the two longitudinal arms of the distal end element, with a box-like shape, is shown open so as to show the motion transmission to rotate the terminal element, located inside such longitudinal arm;
- Figure 17 shows a partial isometric view of the gangway according to the invention, near the hinge axis about which the terminal element is hinged with respect to the distal end element, in which one of the two longitudinal arms of the distal end element is shown open to show part of the motion transmission thereinside, and in which a first step is blocked with the walkway surface thereof arranged parallel, and substantially coplanar, with respect to the walkway surface of the distal end element;
- Figure 18 shows a partial isometric view of the walkway according to the invention, near the hinge axis about which the terminal element is hinged with respect to the distal end element, in which a portion of the first step has been removed to allow showing the interior of the gangway, and in which the rotary actuation means are shown in partial section with a section plane passing through the hinge axis to show the components thereof;
- Figure 19 shows a partial isometric view of the gangway according to the invention, in which a portion of one of the box-like longitudinal arms of the terminal element has been removed to show a part of the orientation transmission means for transmitting the orientation of the treadable plane of a first step arranged near the hinge axis and maintained according to a predetermined fixed orientation, to the remaining steps of the plurality, in any angular position of the terminal element with respect to the distal end element, in which said orientation transmission means are arranged inside such box-like longitudinal arm;
- Figure 20 shows a partial isometric view of the terminal element, when it is arranged with the terminal element axis in a position parallel to or coincident with the gangway axis, in which a portion of two ad-

jacent steps and a portion of a box-like longitudinal arm of the terminal element have been removed to show the inside of the terminal element, and in which the orientation transmission means have been shown in partial section with a section plane passing through the rotation axes of such two adjacent steps;

- Figure 21 and Figure 22 show an isometric view from below of the gangway according to the invention, respectively in the minimum length position and in the maximum length position, in which, in the minimum length position, a lower portion of the proximal end element has been removed to show an end portion of the telescopic actuation means for telescopically translating the telescopic gangway elements to one another along the gangway axis.

Description of the preferred embodiments

[0027] With reference to the Figures, a telescopic gangway for a floating navigation unit, in accordance with the invention, is overall indicated with reference numeral 1.

[0028] Reference will be made to a "floating navigation unit" to indicate any generic floating unit 100 for the transport of people or things on water, independently of the presence or absence or of the type of propulsion system, for example sailing, motor, rowing, and independently of the length of such floating unit 100, for example, selected from a vessel, a boat, a ship.

[0029] For example, the floating navigation unit 100 is a motor yacht.

[0030] The retractable telescopic gangway 1 defines an upper gangway walkway plane, and is adapted to allow the transit of an individual entering, or exiting, said floating navigation unit 100, transiting on said upper gangway walkway plane 5.

[0031] The gangway 1 comprises at least two gangway elements 10, 20, telescopically engaged and slidable with respect to one another along a gangway axis P-P parallel to said upper gangway walkway surface 5, between a minimum gangway length L1 and a maximum gangway length L2.

[0032] Said at least two gangway elements 10, 20, telescopically engaged with one another, comprise a proximal end element 10, adapted to be fastened to said floating navigation unit 100, and an opposite distal end element 20.

[0033] The gangway 1 comprises telescopic actuation means 9 for moving said at least two gangway elements 10, 20 with respect to one another along the gangway axis between said minimum gangway length L1 and said maximum gangway length L2.

[0034] In accordance with an embodiment, for example shown in Figures 21 and 22, the telescopic actuation means comprise an hydraulic cylinder having opposite ends connected to the proximal end element and to the distal end element, and acting along an axis parallel to the gangway axis P-P.

[0035] The gangway 1 comprises a terminal element 40 having an elongated shape defining a terminal element axis T-T along a main development direction thereof, said terminal element 40 being rotatably engaged with said distal end element 20 about a hinge axis C-C parallel to the gangway walkway plane 5 and orthogonal to the gangway axis P-P and to the terminal element axis T-T, in a manner adjustable between an rest angular position, in which the terminal element 40 is superimposed on the distal end element 20, and an operative position, in which the terminal element 40 is angularly spaced with respect to the distal end element 20, between a maximum upward inclination position and a maximum downward inclination position.

[0036] The gangway 1 further comprises rotary actuation means 60 for rotating said terminal element 40 with respect to said distal end element 20.

[0037] The terminal element axis T-T forms an opening angle α with respect to the gangway axis P-P measured starting from the gangway axis P-P up to the terminal element axis (T-T) according to an angular measurement direction, in which the maximum upward inclination position corresponds to a value of operative opening angle α comprised between 90° and 180° , preferably of about 110° , and in which the maximum downward inclination position corresponds to a value of operative opening angle α comprised between 180° and 270° , preferably of 250° .

[0038] In accordance with an embodiment, in the rest angular position, the terminal element 40 is housed within the space of the distal end element 20.

[0039] Thereby, when the terminal element 40 is folded inside the distal end element, i.e. when the terminal element 40 is in the resting position thereof, it does not protrude from the distal end element, and thereby it may be introduced together with the distal end element 40 inside the space of the proximal end element, in the minimum gangway length configuration L1.

[0040] In accordance with an embodiment, the distal end element 20 comprises a housing compartment 21 comprising at least one open side 22, said housing compartment 21 being configured to completely receive and house therein said terminal element 40 in the rest angular position through said at least one open side 22.

[0041] In accordance with an embodiment, the distal end element 20 comprises a closing element 23 at said at least one open side 22, said closing element 23 being movable between an open position, in which said terminal element 40 is allowed to access or exit said housing compartment 21 through said at least one open side 22, and a closed position, in which said closing element 23 closes said at least one open side 22.

[0042] In accordance with an embodiment, said at least one open side 22 is an upper side of said distal end element 20, and said closing element 23, when in the closed position thereof, forms a distal end element walkway plane 24, at least partially forming said gangway walkway plane 5.

[0043] In accordance with an embodiment, the distal end element walkway plane gangway 24 is a flat, or substantially flat, surface.

[0044] In accordance with an embodiment, said closing element 23 is slidingly engaged with said distal end element 20 along, or parallel to, said gangway axis P-P between the open position and the closed position.

[0045] In accordance with an embodiment, the distal end element 20 has a structure comprising at least one longitudinal arm 25, 26 parallel to the gangway axis P-P, extending along the length of the distal end element 20 and defining said housing compartment 21.

[0046] In accordance with an embodiment, the distal end element 20 has a structure comprising two straight longitudinal arms 25, 26 parallel to each other and parallel to the gangway axis P-P, extending along the length of the distal end element 20 considered parallel to the gangway axis P-P, in which said two longitudinal arms 25, 26 define two opposite longitudinal side walls of the distal end element 20, and define and delimit said housing compartment 21 therebetween.

[0047] In accordance with an embodiment, the closing element 23 comprises a flat plate which is slidable along said two longitudinal arms 25, 26 parallel to said gangway axis P-P between the open position and the closed position.

[0048] In accordance with an embodiment, the hinge axis C-C is located near a first free end 28 of the distal end element 20, facing the side opposite with respect to the proximal end element 10, and near a first end 41 of the terminal element 40.

[0049] In accordance with an embodiment, the rotary actuation means 60 comprise an actuator 61 arranged inside said distal end element 20, near a second end 29 of the distal element 20 opposite to the first end 28; and a motion transmission 62 between the actuator 61 and said terminal element 40, said motion transmission 62 being located inside said distal element 20.

[0050] In accordance with an embodiment, at least one of said at least one longitudinal arm, or at least one of said two longitudinal arms 25, 26 has a box-like shape defining an internal space 27, said motion transmission 62 being located within said internal space 27.

[0051] In accordance with an embodiment, the actuator 61 is a rotary motor having a drive shaft 63 in which the terminal element 40 has a terminal element shaft 42 integral with said terminal element 40 and coaxial to said hinge axis C-C.

[0052] Furthermore, the motion transmission 62 comprises a driving wheel 64 integral with the drive shaft 63, a driven wheel 65 integral with the terminal element shaft 42, a transmission belt or chain 66 engaged with said driving wheel 64 and said driven wheel 65, to transmit the motion from said driving wheel 64 to said driven wheel 65.

[0053] In accordance with an embodiment, said terminal element 40 comprises a plurality of orientable steps 43, 44, 45 distributed along the terminal element axis T-

T, each step 43, 44, 45 of said plurality defining a respective treadable step plane 46, each step of said plurality 43, 44, 45 being rotatably engaged with respect to said distal end element 40 about a respective step rotation axis 47 parallel to said hinge axis C-C.

[0054] Furthermore, said terminal element 40 comprises orientation transmission means 50 for transmitting the orientation of the treadable plane 46 of a first step 44, arranged at the hinge axis C-C and maintained according to a predetermined fixed orientation, to the remaining steps 43, 45 of the plurality, so that the treadable step plane 46 of each of said remaining steps 43, 45 remains parallel to the treadable plane 46 of said first step 44 in any angular position of the terminal element 40 with respect to the distal end element 20.

[0055] In accordance with an embodiment the predetermined fixed orientation of the treadable plane 46 of said first step 44 is substantially horizontal in use.

[0056] In accordance with an embodiment, the predetermined fixed orientation of the treadable plane 46 of said first step 44 is fixed, or locked, with respect to the distal end element 20.

[0057] In accordance with an embodiment, the predetermined fixed orientation of the treadable plane 46 of said first step 44 is coplanar or parallel to the distal end element walkway plane 24.

[0058] In accordance with an embodiment, the terminal element 40 comprises at least one straight terminal longitudinal arm 48, 49 extending parallel to the terminal element axis T-T over the length of the terminal element 40 considered along the terminal element axis T-T.

[0059] In accordance with an embodiment, each step 43, 44, 45 is hinged to the at least one terminal longitudinal arm 48, 49 by means of a respective step shaft 51 integral with said each step 43, 44, 45 and coaxial to a respective step rotation axis 47.

[0060] In accordance with an embodiment, said orientation transmission means 50 are connected to the step shaft 51 of all the steps of said plurality of steps 43, 44, 45.

[0061] In accordance with an embodiment, said at least one terminal longitudinal arm 48, 49 has a box-like shape defining a respective internal space 53 of a terminal longitudinal arm, wherein said orientation transmission means 50 are located inside said internal space 53 of at least one of said at least one terminal longitudinal arm 48, 49.

[0062] In accordance with an embodiment, the orientation transmission means 50 comprise a respective wheel 54 integral with, and coaxial to each respective step shaft 51 of said plurality of steps 43, 44, 45 and a belt, or chain, transmission element 56 engaging said respective wheel 54 of all the steps of said plurality of steps 43, 44, 45.

[0063] In accordance with an embodiment, the orientation transmission means 50 comprise at least one belt-tensioner 59 configured to transversely press against said belt transmission element 56, to keep it tensioned.

[0064] In accordance with an embodiment, the at least

one terminal longitudinal arm 48, 49 is formed by two straight terminal longitudinal arms 48, 49 parallel to each other and to the terminal element axis T-T, said steps of said plurality of steps 43, 44, 45 being interposed between, and rotatably engaged with, said two terminal longitudinal arms 48, 49.

[0065] In accordance with an embodiment, the treadable plane of a last step 45 of said plurality, arranged near a free end 57 of said terminal element 40 opposite to the hinge axis C-C, has an enlarged portion which protrudes with respect to said last step 45 along a direction parallel, and/or transverse, with respect to the gangway axis P-P.

[0066] In accordance with an embodiment, the proximal end element 10 is dimensioned so that, in a minimum gangway length configuration L1, the remaining elements of said at least two gangway elements telescopically engaged with one another 20 and said terminal element 40 are all housed inside the space of said proximal end element 10.

[0067] In accordance with an embodiment, the proximal end element 10 has a box-like shape defining an internal space of a proximal element 10, wherein, in said minimum gangway length configuration L1, said remaining elements of said at least two gangway elements 20 and said terminal element 40 are all completely housed inside said internal space of proximal element 10.

[0068] In other words, the proximal end element 10 preferably comprises an elongated casing 80 with a box-like shape, having a casing opening 81 at one end of said casing 80, adapted to allow the exit and the entry of the other gangway elements 20 and of the terminal element 40 between the minimum gangway length L1 and the maximum gangway length L2 therethrough.

[0069] In accordance with an embodiment, the proximal end element 10 comprises a closing door 82, adapted to close or open said casing opening 81.

[0070] In accordance with an embodiment, the proximal end element 20 comprises fastening means 70 for a fastening to a floating navigation unit 100, adapted to allow the fastening of said proximal element 10 within the space of said floating navigation unit 100.

[0071] In accordance with an embodiment, the at least two gangway elements telescopically engaged with one another 10, 20, are exactly two elements formed by said proximal end element 10 and by said distal end element 20, said distal end element 20 being directly telescopically engaged with said proximal end element 10, avoiding further gangway elements interposed between said proximal end element 10 and said distal end element 20.

[0072] According to another aspect of the present invention, the aforesaid objects and advantages are met by a floating navigation unit 100 comprising a telescopic gangway 1 according to any of the features described above.

[0073] The floating navigation unit 100 comprises an internal housing 101 with an opening 102 towards the outside of said floating navigation unit 100.

[0074] Furthermore, the proximal end element 10 is fastened inside said housing 101 so that said gangway 1 may be extended towards the outside of said floating navigation unit 100 through said opening 102, so that in the gangway minimum length position L1, said gangway 1 remains entirely contained within said housing, avoiding protruding outside of said floating navigation unit 100 through said opening 102.

[0075] In accordance with an embodiment, the maximum upward inclination position corresponds to a value of operative opening angle α comprised between 90° and 180° , preferably of about 110° , and in which the maximum downward inclination position corresponds to a value of operative opening angle α comprised between 180° and 270° , preferably of about 250° , said operative opening angle α being measured starting from a horizontal plane, or from the walkway plane of the distal end element, to the terminal element axis T-T according to a same angular measurement direction.

[0076] In accordance with an embodiment, the terminal element 40 is rotatable with respect to a distal end element 20, along a vertical, or substantially vertical, plane in use.

[0077] In accordance with an embodiment, the gangway axis P-P is arranged substantially horizontal in use.

[0078] In accordance with an embodiment, the upper gangway walkway plane 5 is arranged horizontally, or substantially horizontally, in use.

[0079] In accordance with an embodiment, the gangway axis P-P is arranged substantially parallel to a longitudinal axis of the floating navigation unit, for example in which such longitudinal axis is arranged according to a preferential navigation direction of such floating unit 100, for example, such longitudinal axis is arranged along a main development direction of the floating navigation unit 100.

[0080] In accordance with an embodiment, the telescopic gangway 1 is arranged at the stern of the floating navigation unit 100 with respect to a main navigation direction.

[0081] In accordance with an embodiment, the telescopic gangway 1 is fastened to the floating navigation unit 100 in an emerged position and near a waterline of the floating navigation unit 100.

[0082] "Waterline" means the line which separates the freeboard, i.e., the emerged part, and the drought, i.e., the submerged part of the floating navigation unit 100.

[0083] Thereby, by rotating the terminal element 40 with respect to the distal end element 20 by an angle which brings it below the gangway walkway plane, the terminal element 40 will be partially submerged and will facilitate the transit of an individual from the water on board the floating navigation unit 100, and the access to the water from the floating navigation unit 100.

[0084] In accordance with an embodiment, the retractable telescopic gangway is fastened to the floating navigation unit 100, in particular to the yacht, above, and at a minimum distance from, a stern platform 106 of the

floating navigation unit 100, or of the yacht.

[0085] In order to meet contingent needs, those skilled in the art may make changes and adaptations to the embodiments of the device described above, and replace elements with others which are functionally equivalent, without departing from the scope of the following claims. Each of the features described as belonging to a possible embodiment may be achieved irrespective of the other embodiments described.

[0086] It should be noted that the Figures are not necessarily to scale.

[0087] All the features described herein may be combined according to any combination, except for the combinations in which at least some of such features are mutually exclusive.

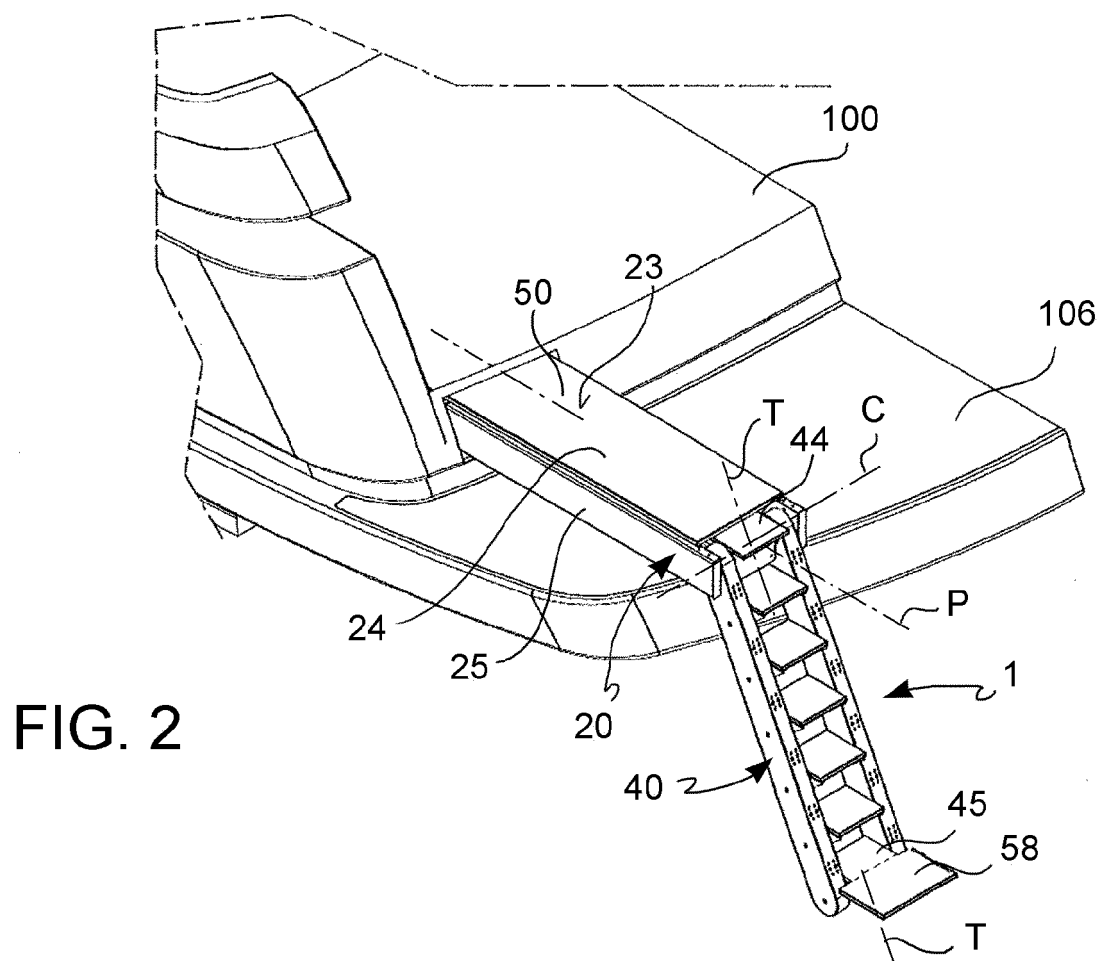
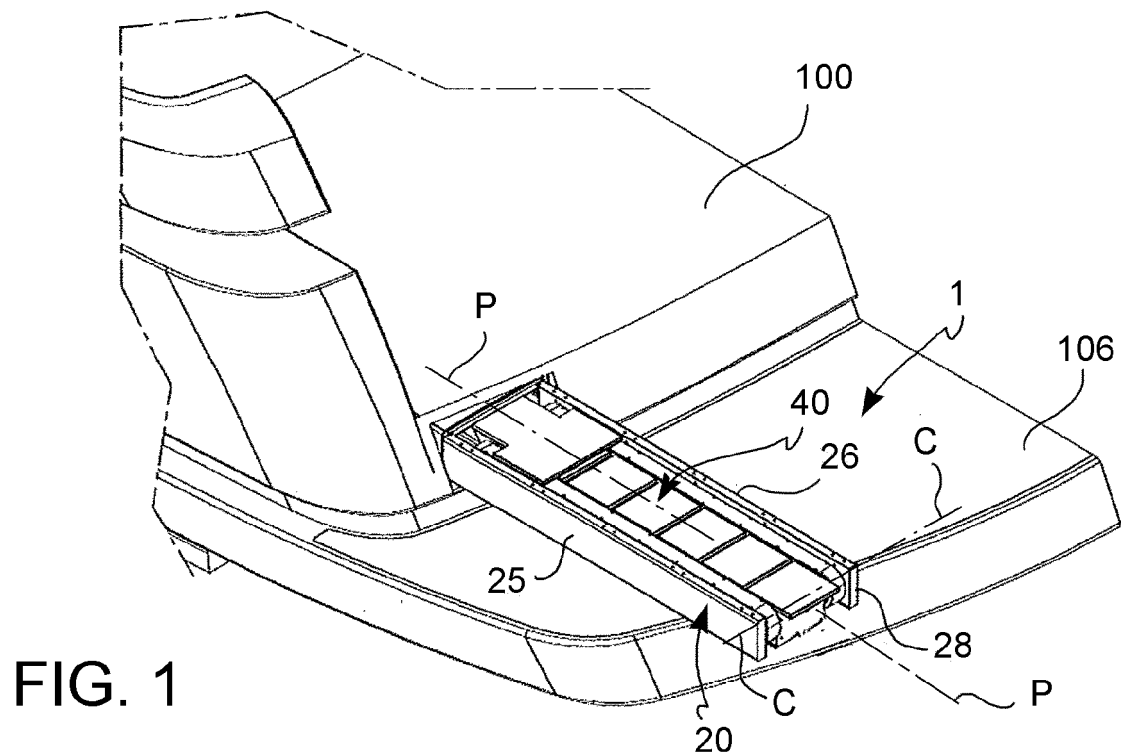
Claims

1. A retractable telescopic gangway (1) for a floating navigation unit (100), defining an upper gangway walkway plane (5), and adapted to allow the transit of an individual entering, or exiting, said floating navigation unit (100), transiting on said upper gangway walkway plane (5), wherein said retractable telescopic gangway (1) comprises:

- at least two gangway elements (10, 20) telescopically engaged and slidable with respect to one another along a gangway axis (P-P) parallel to said walkway surface between a minimum gangway length (L1) and a maximum gangway length (L2); said at least two gangway elements (10, 20), telescopically engaged with one another, comprising a proximal end element (10) adapted to be fastened to said floating navigation unit (100), and one opposite distal end element (20);
- telescopic actuation means (9) for moving said at least two gangway elements (10, 20) with respect to one another along the gangway axis between said minimum gangway length (L1) and said maximum gangway length (L2);
- a terminal element (40) having an elongated shape defining a terminal element axis (T-T) along a main development direction thereof, said terminal element (40) being rotatably engaged with said distal end element (20) about a hinge axis (C-C) parallel to the gangway walkway plane (5) and orthogonal to the gangway axis (P-P) and to the terminal element axis (T-T), in a manner adjustable between an rest angular position, in which the terminal element (40) is superimposed on the distal end element (20), and an operative position, in which the terminal element (40) is angularly spaced with respect to the distal end element (20), between a maximum upward inclination position and a maximum

- downward inclination position;
- rotary actuation means (60) for rotating said terminal element (40) with respect to said distal end element (20) .
2. A gangway (1) according to claim 1, wherein in the rest angular position, the terminal element (40) is housed within the space of the distal end element (20).
 3. A gangway (1) according to at least one preceding claim, wherein the distal end element (20) comprises a housing compartment (21) comprising at least one open side (22), said housing compartment (21) being configured to completely receive and house thereinside said terminal element (40) in the rest angular position through said at least one open side (22).
 4. A gangway (1) according to claim 3, wherein the distal end element (20) comprises a closing element (23) at said at least one open side (22), said closing element (23) being movable between an open position, in which said terminal element (40) is allowed to access or exit said housing compartment (21) through said at least one open side (22), and a closed position, in which said closing element (23) closes said at least one open side (22).
 5. A gangway (1) according to claim 4, wherein said at least one open side (22) is an upper side of said distal end element (20), and wherein said closing element (23), when in the closed position, forms a distal end element walkway plane (24), at least partially forming said gangway walkway plane (5).
 6. A gangway (1) according to claims 4 to 5, wherein said closing element (23) is slidably engaged with said distal end element (20) along, or parallel to, said gangway axis (T-T) between the open position and the closed position.
 7. A gangway (1) according to at least one claim from 3 to 6, wherein the distal end element (20) has a structure comprising at least one longitudinal arm (25, 26) parallel to the gangway axis (P-P), extending along the length of the distal end element (20) measured along the gangway axis (P-P) and defining said housing compartment (21), or wherein the distal end element (20) has a structure comprising two straight longitudinal arms (25, 26) parallel to each other and parallel to the gangway axis (P-P), extending along the length of the distal end element (20) considered parallel to the gangway axis (P-P), wherein said two longitudinal arms (25, 26) define two opposite longitudinal side walls of the distal end element (20), and define and delimit said housing compartment (21) therebetween.
 8. A gangway (1) according to at least one preceding claim, wherein the hinge axis (C-C) is located near a first free end (28) of the distal end element (20), facing the side opposite with respect to the proximal end element (10), and near a first end (41) of the terminal element (40).
 9. A gangway (1) according to claim 8, wherein the rotary actuation means (60) comprise:
 - an actuator (61) arranged inside said distal end element (20), near a second end (29) of the distal element (20) opposite to the first free end (28);
 - a motion transmission (62) between the actuator (61) and said terminal element (40), said motion transmission (62) being located inside said distal end element (20).
 10. A gangway (1) according to claim 7, wherein at least one of said at least one longitudinal arm, or at least one of said two longitudinal arms (25, 26) has a box-like shape defining an internal space (27), said motion transmission (62) being located within said internal space (27).
 11. A gangway (1) according to claim 9 or 10, wherein the actuator (61) is a rotary motor having a drive shaft (63) ; wherein the terminal element (40) has a terminal element shaft (42) integral with said terminal element (40) and coaxial to said hinge axis (C-C); and wherein the motion transmission (62) comprises a driving wheel (64) integral with the drive shaft (63), a driven wheel (65) integral with the terminal element shaft (42), a transmission belt or chain (66) engaged with said driving wheel (64) and said driven wheel (65), to transmit the motion from said driving wheel (64) to said driven wheel (65) .
 12. A gangway (1) according to at least one preceding claim, wherein said terminal element (40) comprises:
 - a plurality of orientable steps (43, 44, 45) distributed along the terminal element axis (T-T), each step (43, 44, 45) of said plurality defining a respective treadable step plane (46), each step of said plurality (43, 44, 45) being rotatably engaged with respect to said distal end element (40) about a respective step rotation axis (47) parallel to said hinge axis (C-C),
 - orientation transmission means (50) for transmitting the orientation of the treadable plane (46) of a first step (44), arranged at the hinge axis (C-C) and maintained according to a predetermined fixed orientation, to the remaining steps (43, 45) of the plurality, so that the treadable step plane (46) of each of said remaining steps

- (43, 45) remains parallel to the treadable plane (46) of said first step (44) in any angular position of the terminal element (40) with respect to the distal end element (20).
13. A gangway (1) according to claim 12, wherein the predetermined fixed orientation of the treadable plane (46) of said first step (44) is fixed, or locked, with respect to the distal end element (20), and/or wherein the predetermined fixed orientation of the treadable plane (46) of said first step (44) is coplanar or parallel to the distal end element walkway plane (24).
14. A gangway (1) according to at least one claim from 12 to 13, wherein:
- the terminal element (40) comprises at least one straight terminal longitudinal arm (48, 49) extending parallel to the terminal element axis (T-T) over the length of the terminal element (40) considered along the terminal element axis (T-T),
 - each step (43, 44, 45) is hinged to the at least one terminal longitudinal arm (48, 49) by means of a respective step shaft (51) integral with said each step (43, 44, 45) and coaxial to a respective step rotation axis (47);
 - wherein said orientation transmission means (50) are connected to the step shaft (51) of all the steps of said plurality of steps (43, 44, 45).
15. A gangway (1) according to claim 14, wherein said at least one terminal longitudinal arm (48, 49) has a box-like shape defining a respective internal space (53) of terminal longitudinal arm, wherein said orientation transmission means (50) are located inside said internal space (53) of at least one of said at least one terminal longitudinal arm (48, 49), and/or wherein the at least one terminal longitudinal arm (48, 49) is formed by two straight terminal longitudinal arms (48, 48) parallel to each other and to the terminal element axis (T-T), said steps of said plurality of steps (43, 44, 45) being interposed between, and rotatably engaged with, said two terminal longitudinal arms (48, 49).
16. A gangway (1) according to claim 14 or 15, wherein the orientation transmission means (50) comprise:
- a respective wheel (54) integral with, and coaxial to each respective step shaft (51) of said plurality of steps (43, 44, 45);
 - a belt, or chain, transmission element (56) engaging said respective wheel (54) of all the steps of said plurality of steps (43, 44, 45).
17. A gangway (1) according to at least one preceding claim, wherein the proximal end element (10) is dimensioned so that, in a minimum gangway length configuration (L1), the remaining elements of said at least two gangway elements (20) telescopically engaged with one another and said terminal element (40) are all housed inside the space of said proximal end element (10), and/or wherein the proximal end element (10) has a box-like shape defining an internal space of a proximal element (10), wherein, in said minimum gangway length configuration (L1), said remaining elements of said at least two gangway elements (20) and said terminal element (40) are all completely housed inside said internal space of proximal element (10).
18. A floating navigation unit (100) comprising a telescopic gangway (1) according to at least one of the preceding claims, wherein said floating navigation unit (100) comprises an internal housing (101) with an opening (102) towards the outside of said floating navigation unit (100), wherein said proximal end element (10) is fastened inside said housing (101) so that said gangway (1) may be extended towards the outside of said floating navigation unit (100) through said opening (102), so that in the gangway minimum length position (L1), said gangway (1) remains entirely contained within said housing, avoiding protruding outside of said floating navigation unit (100) through said opening (102).



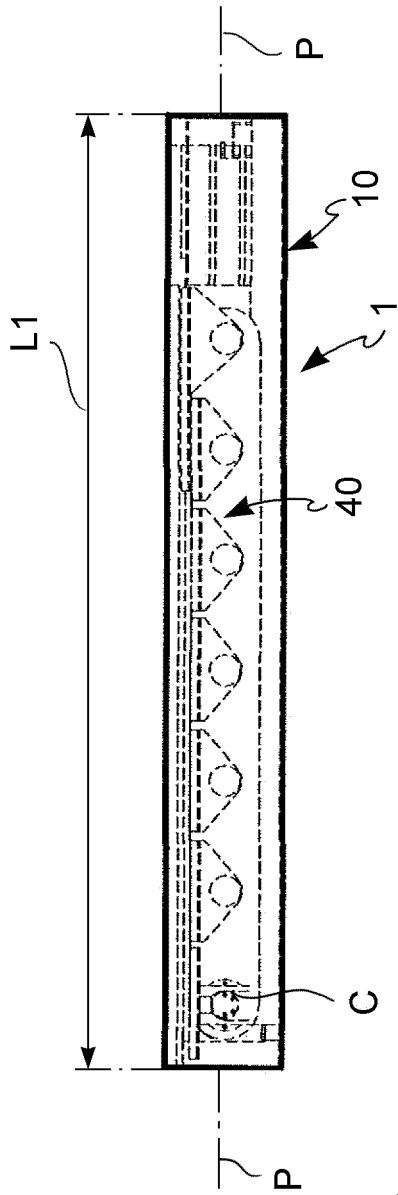


FIG. 3

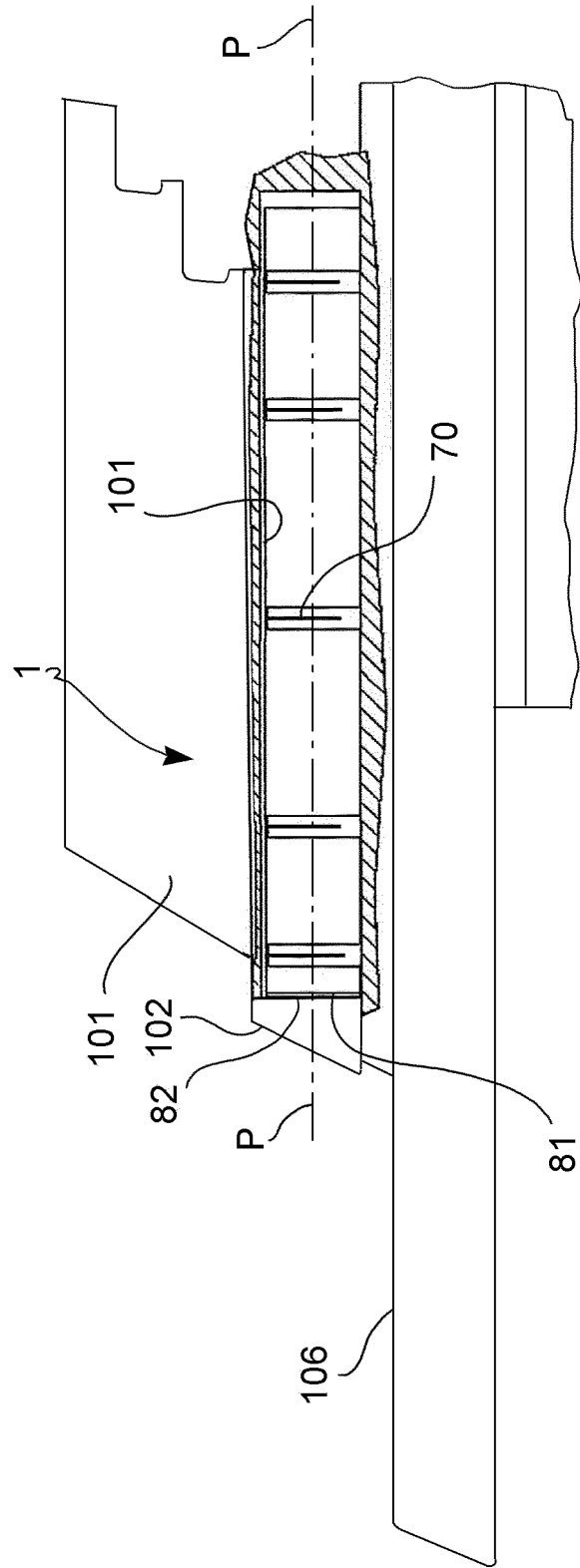


FIG. 4

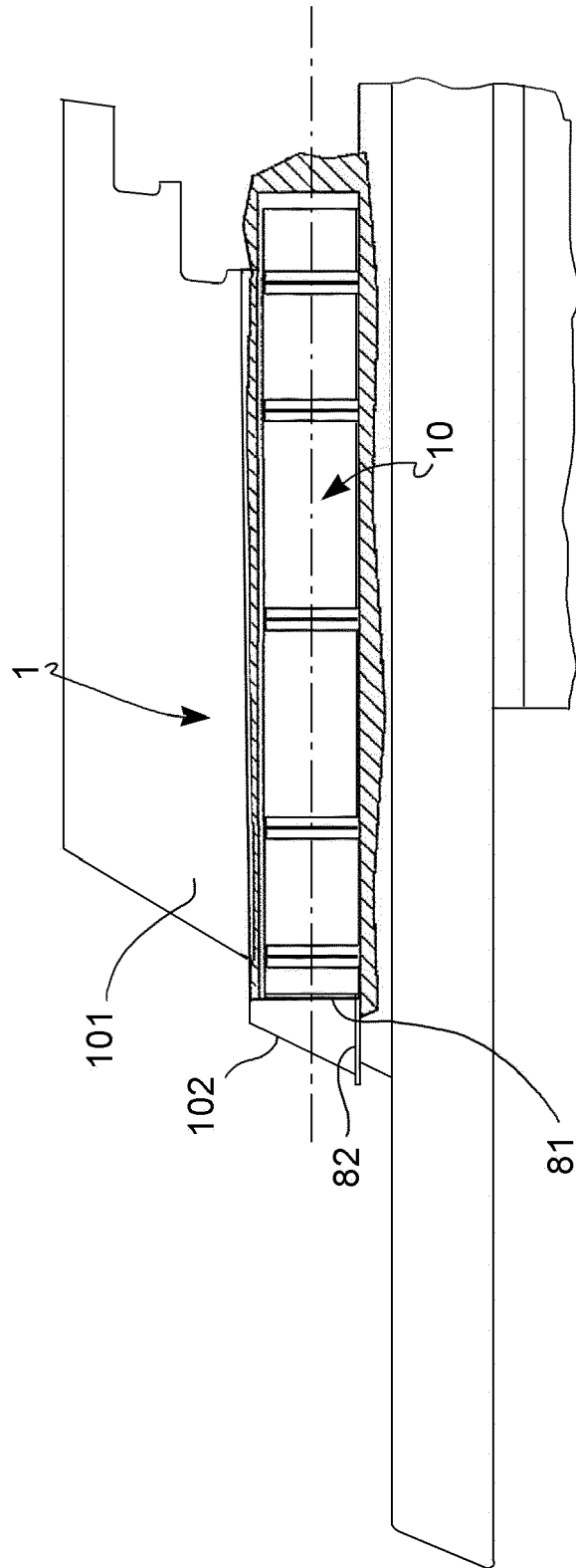


FIG. 5

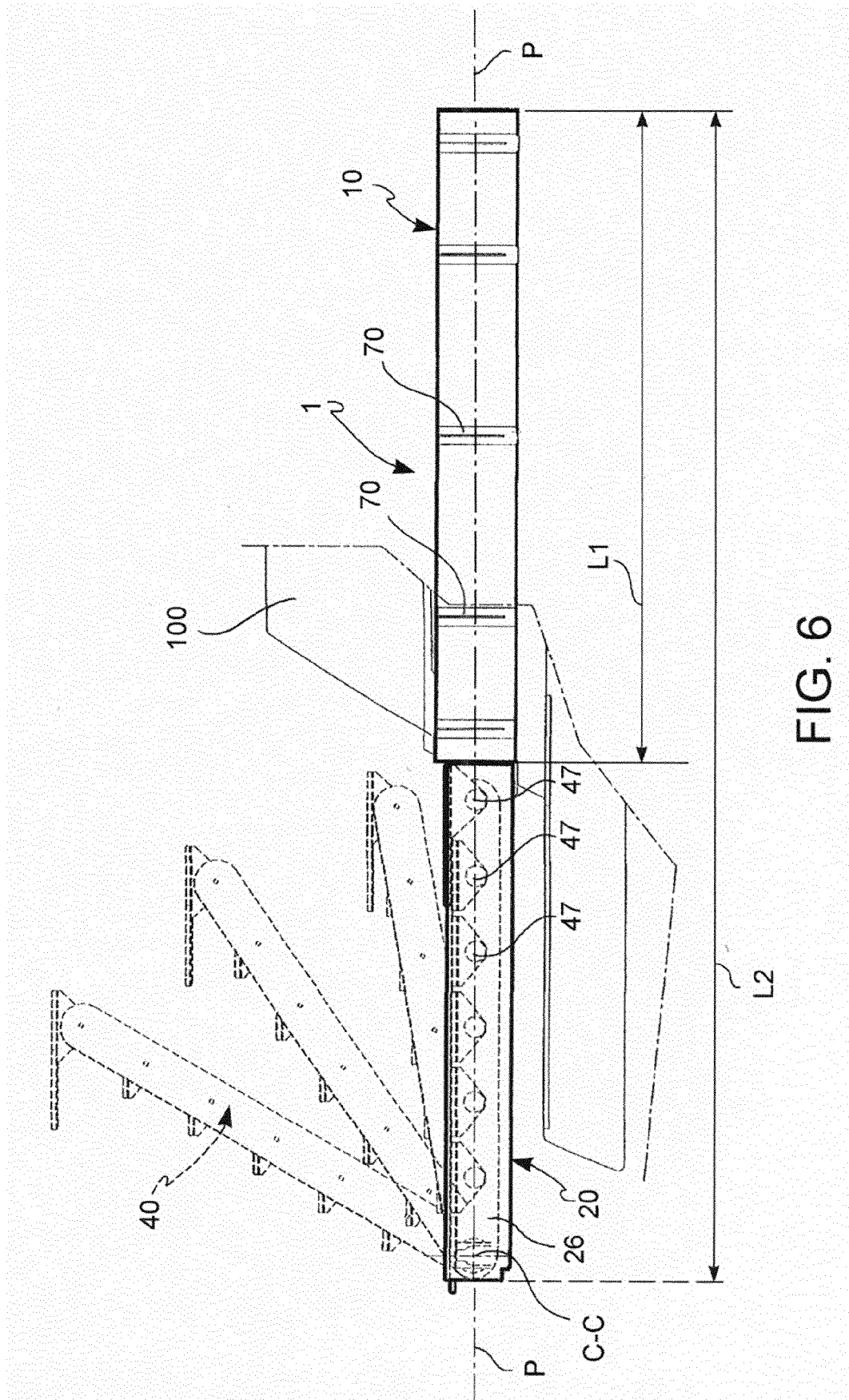
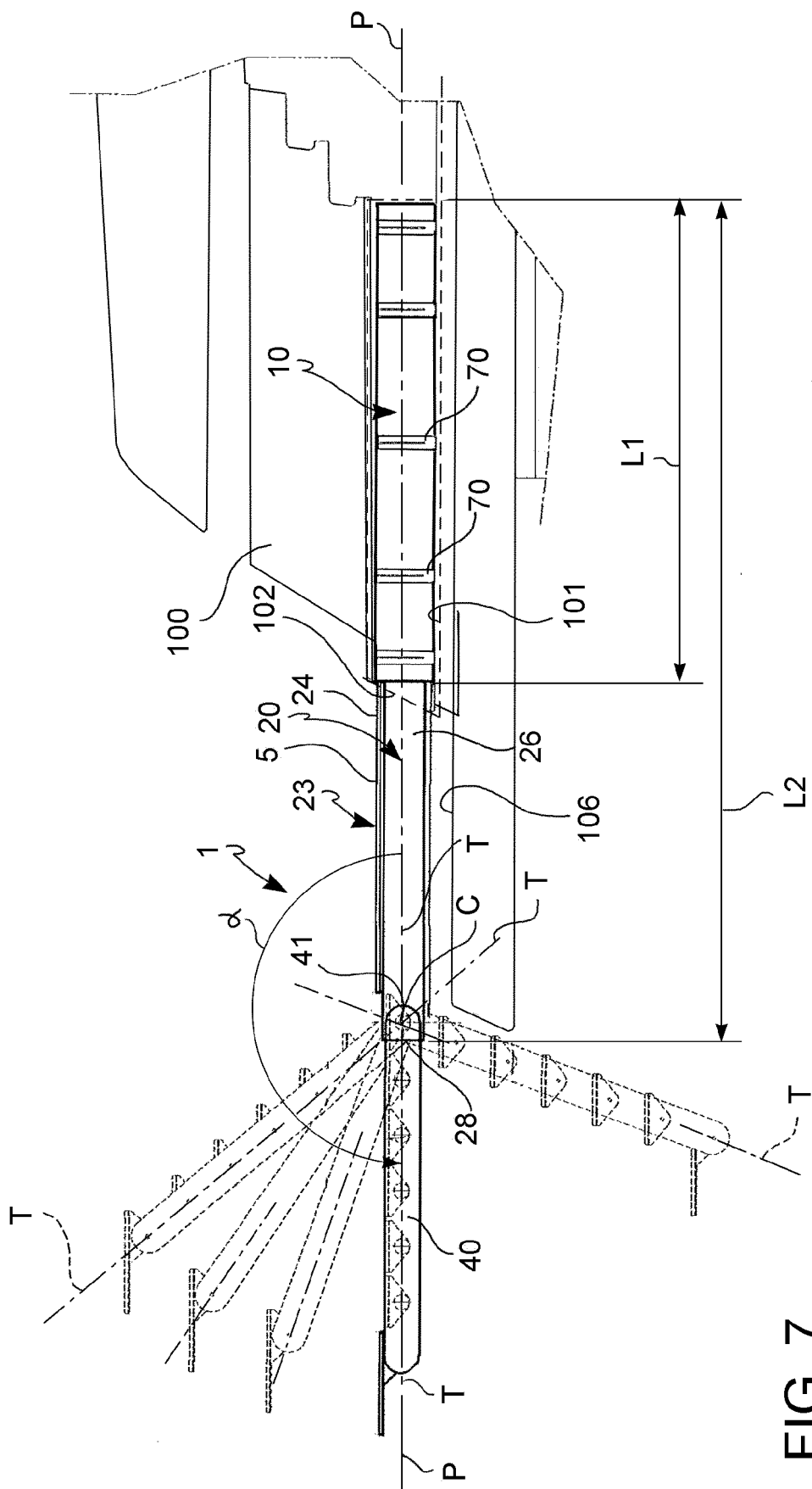


FIG. 6



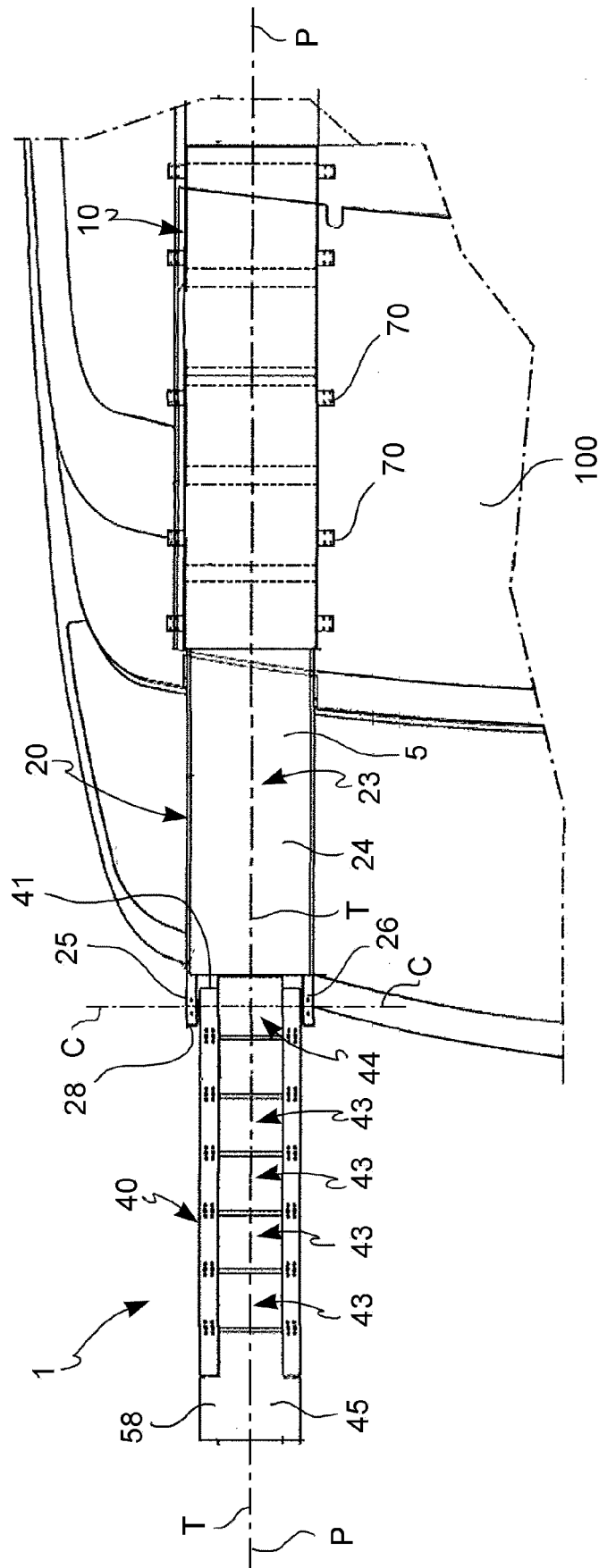
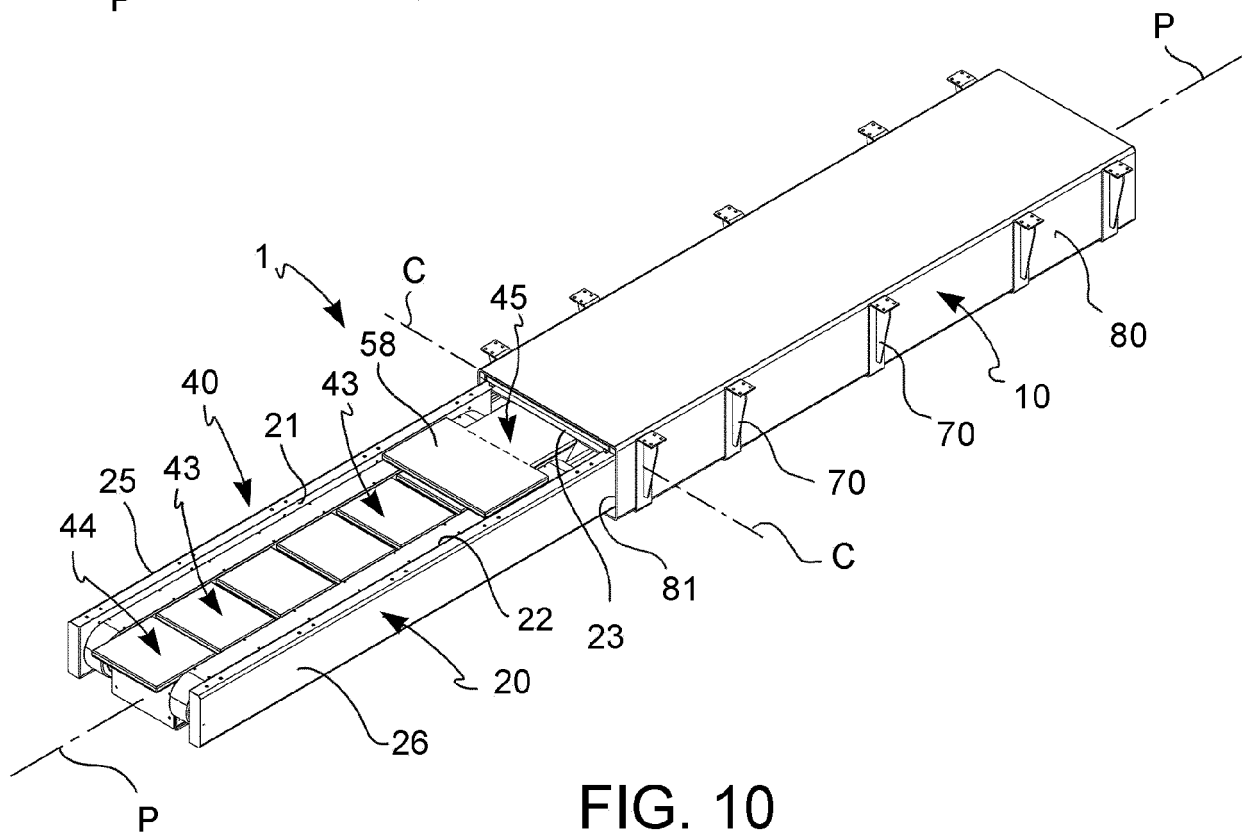
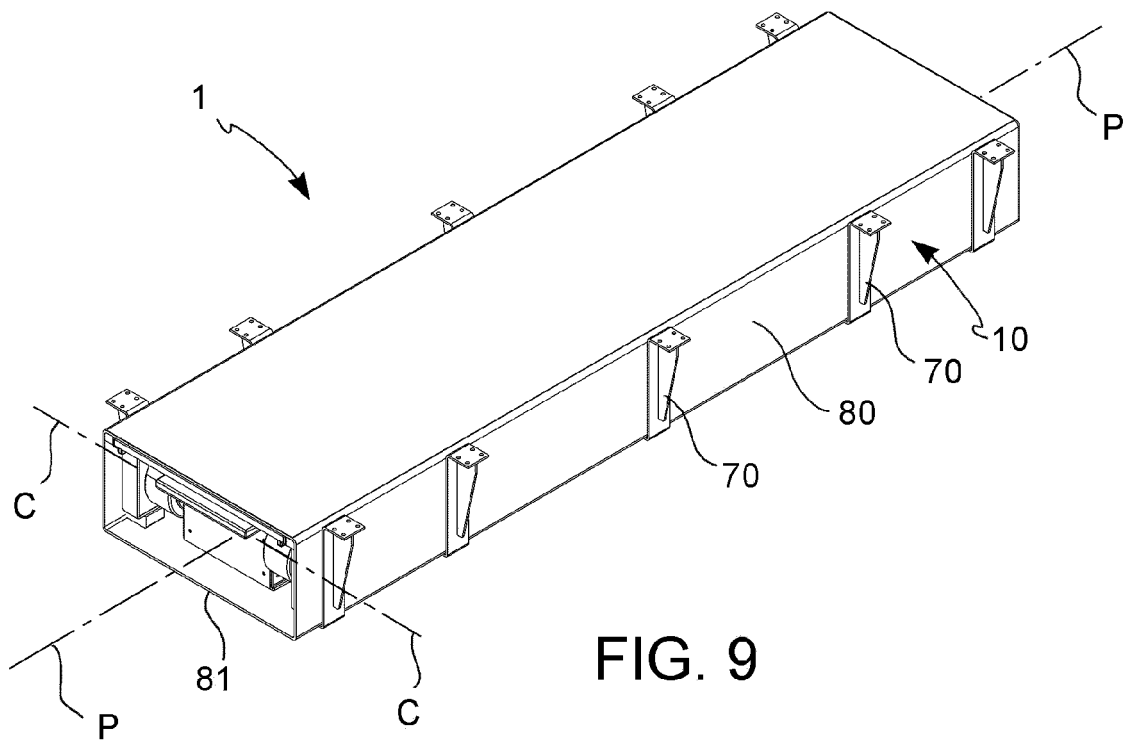
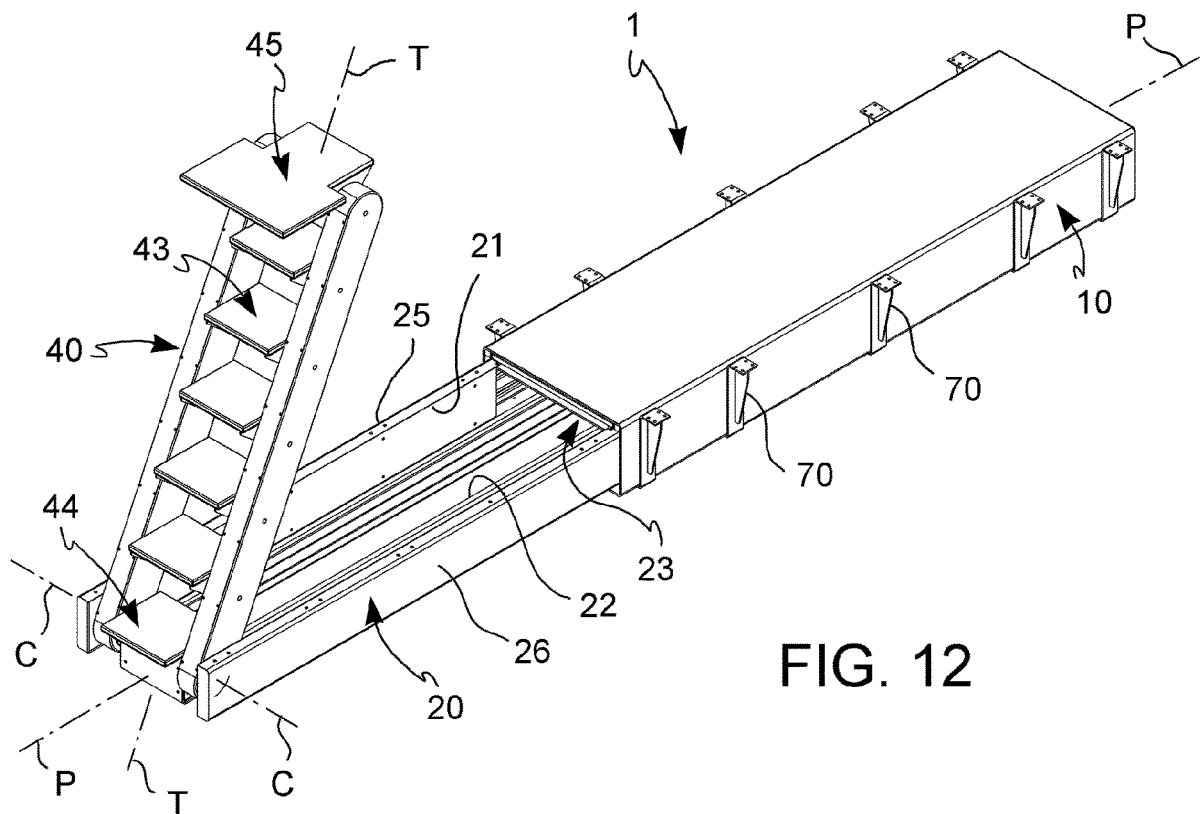
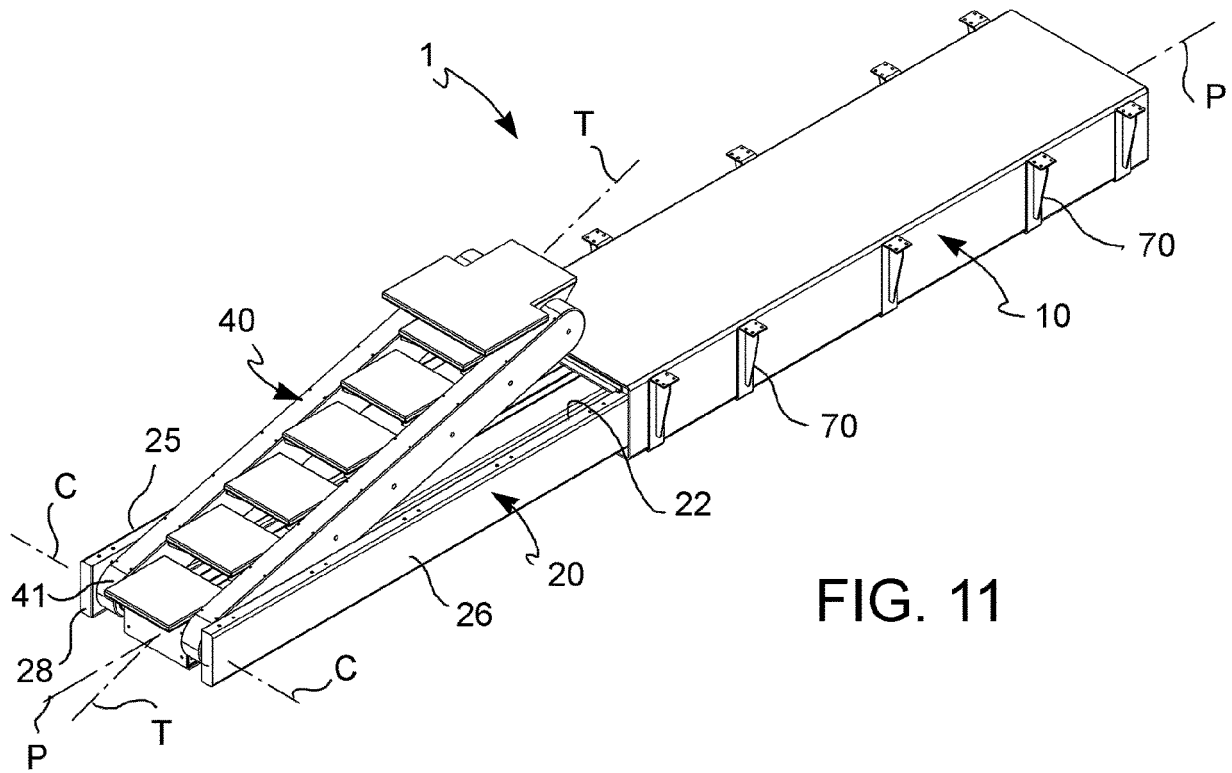
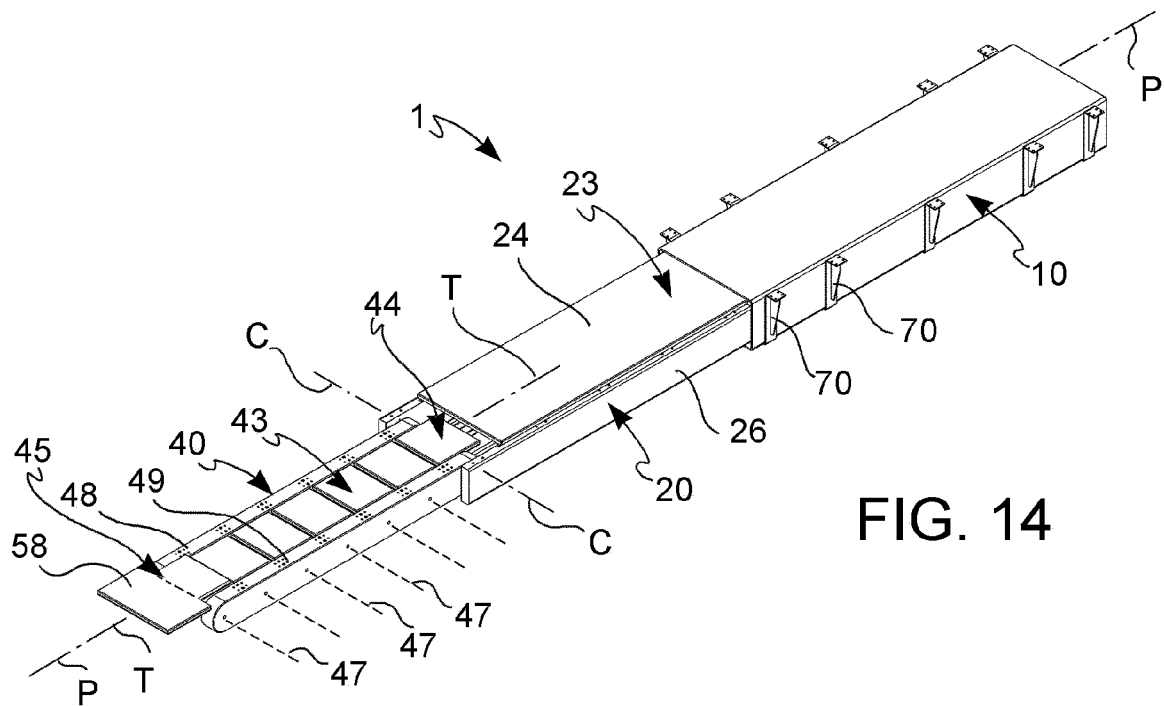
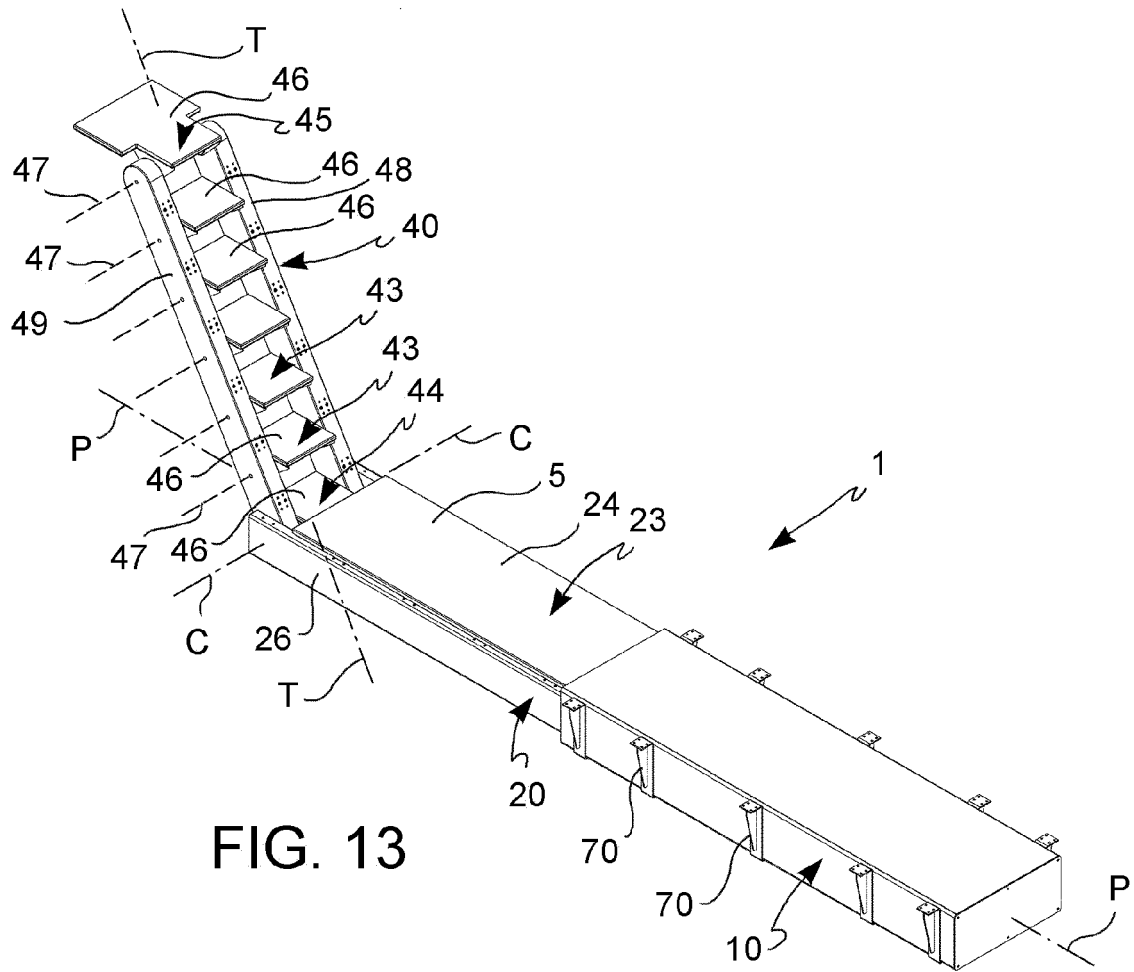


FIG. 8







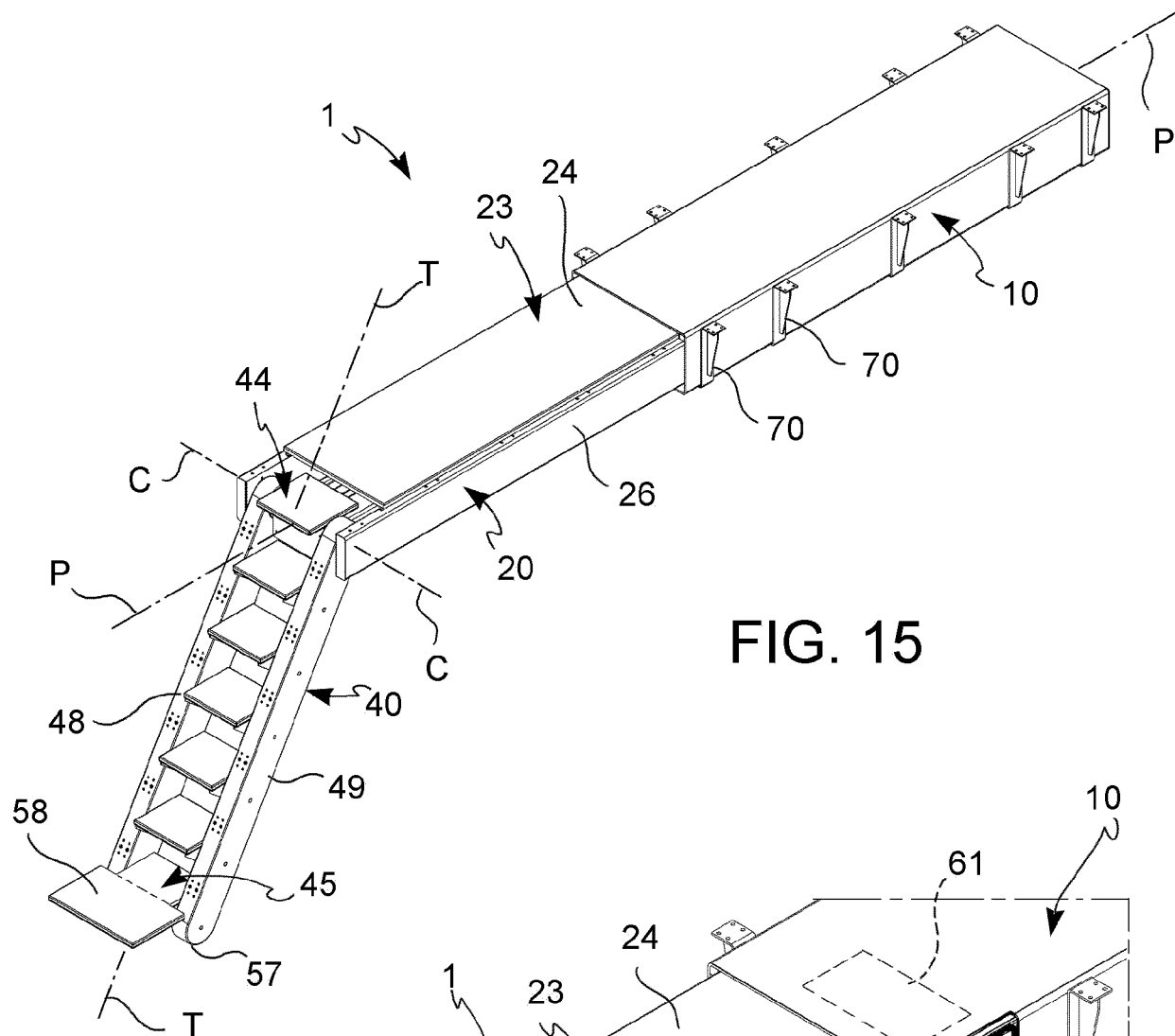


FIG. 15

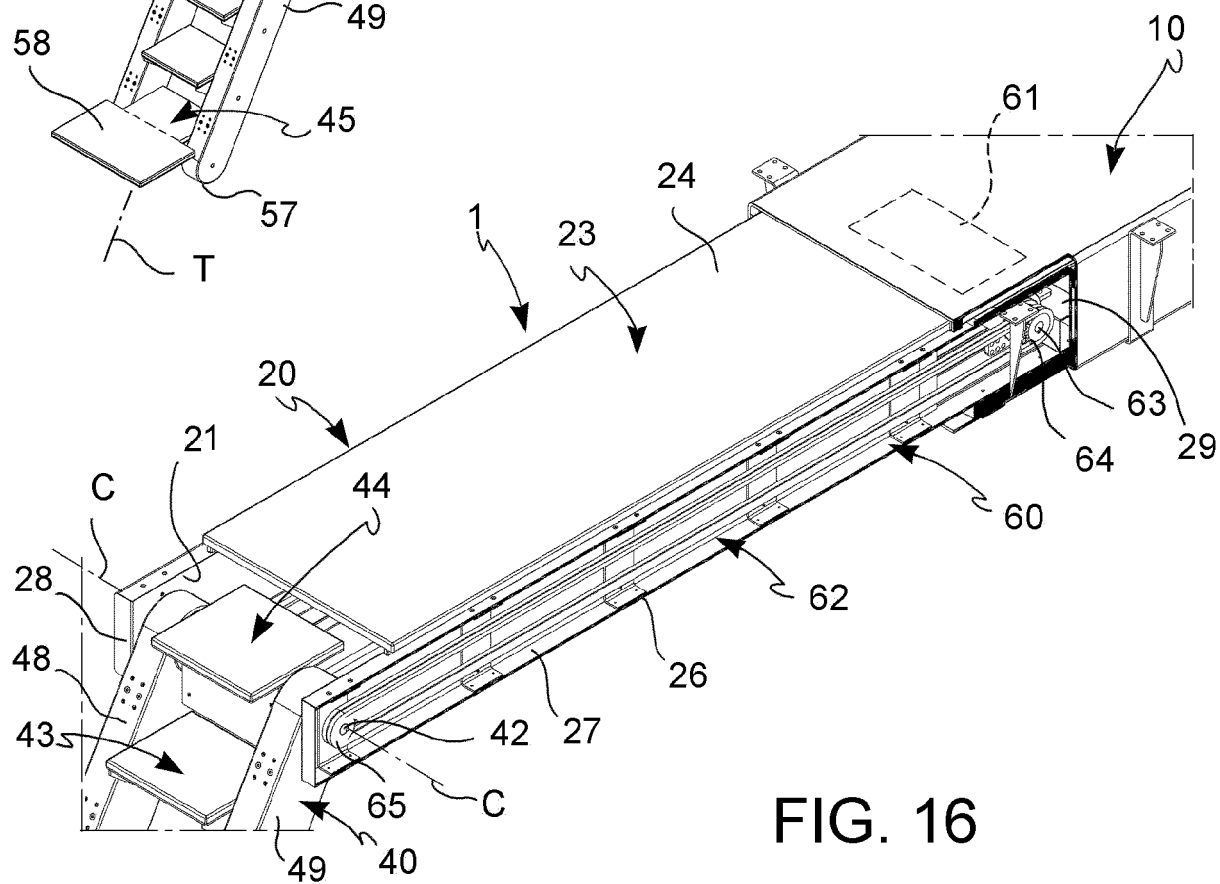


FIG. 16

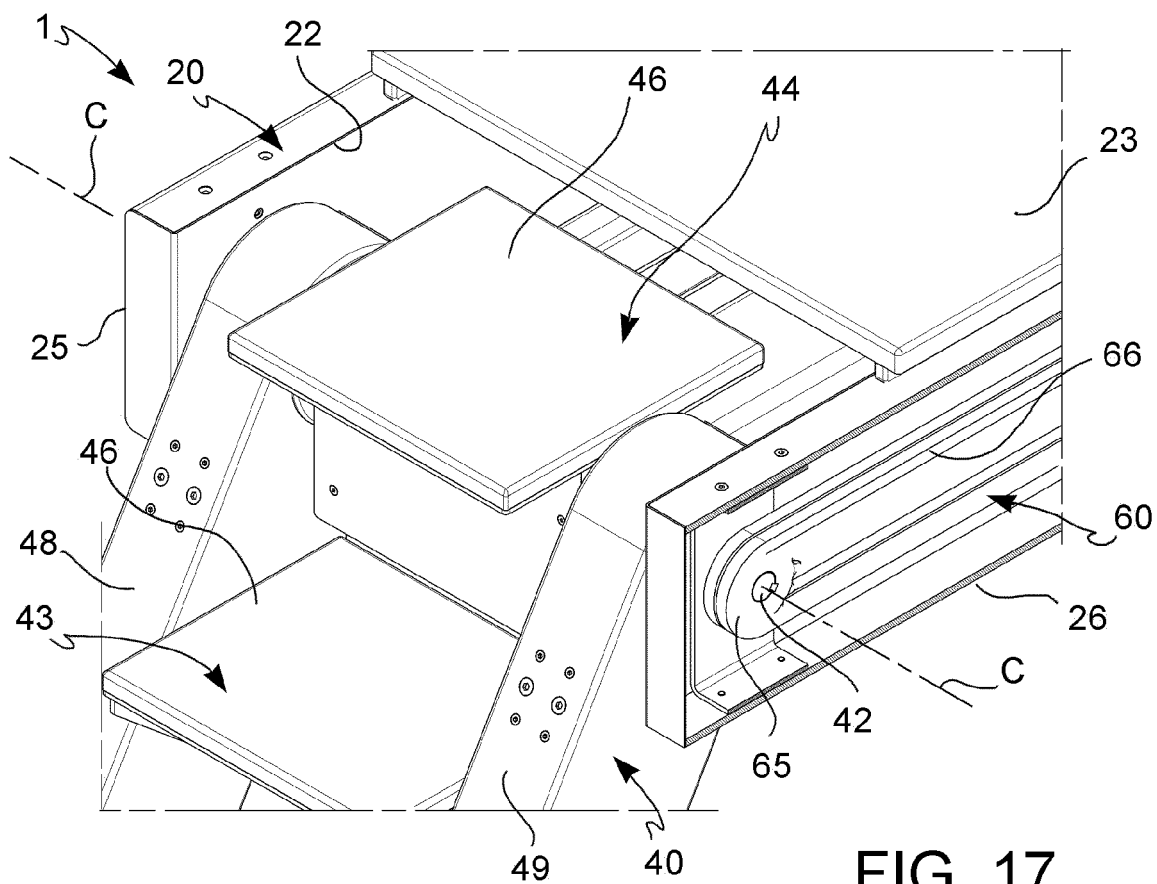


FIG. 17

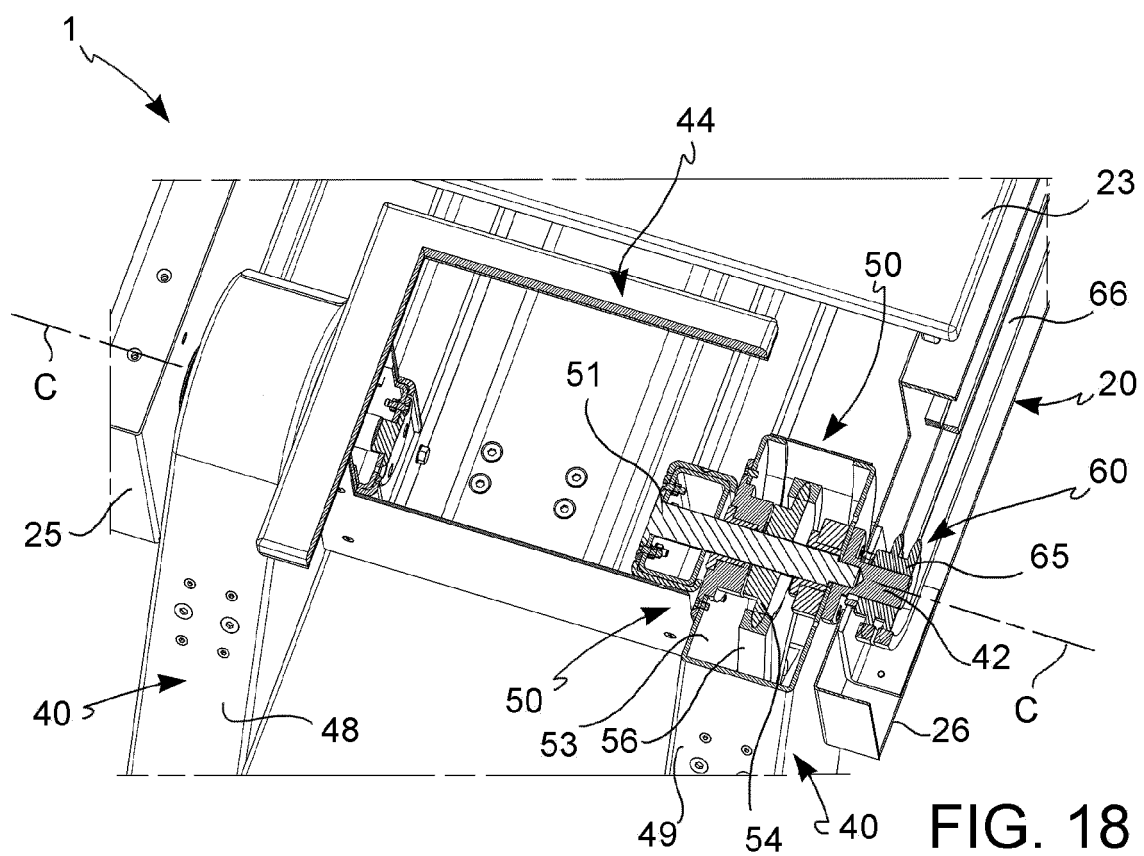


FIG. 18

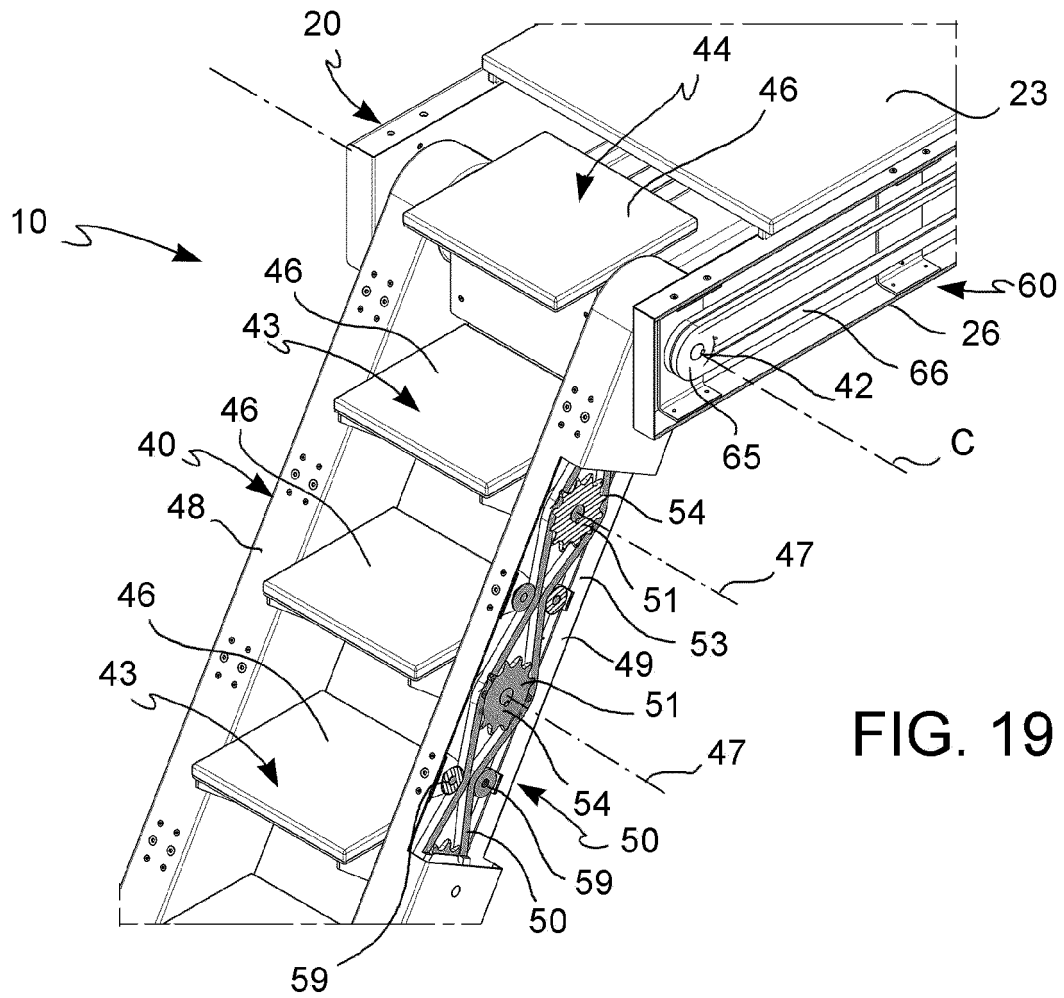


FIG. 19

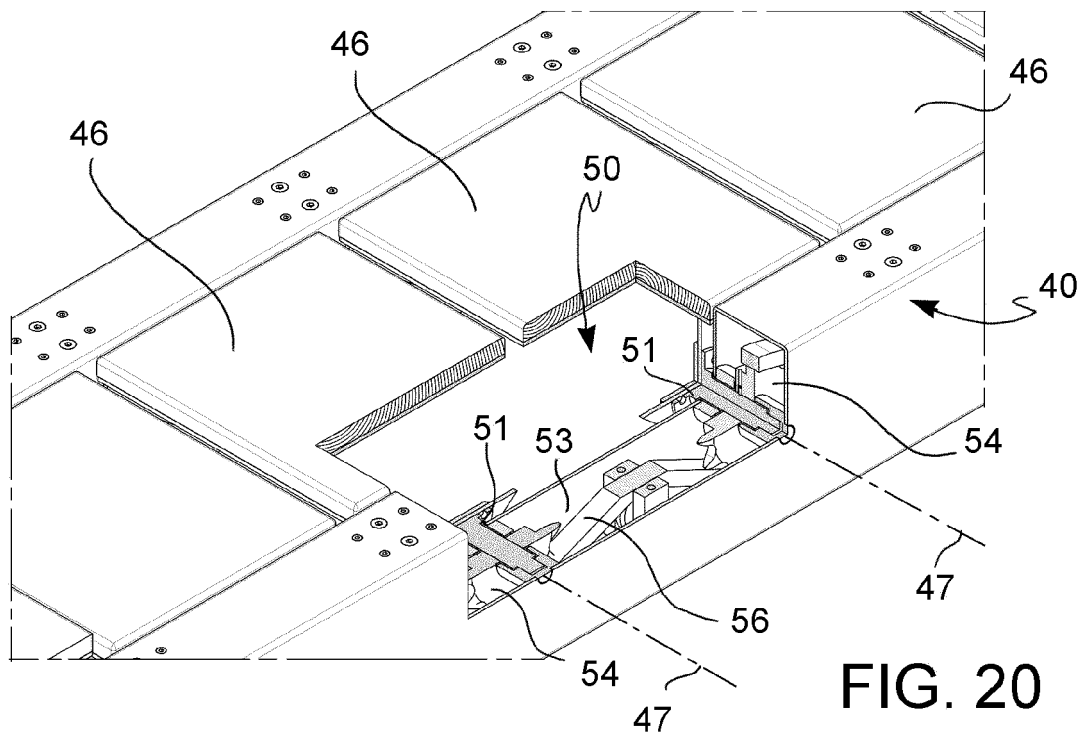
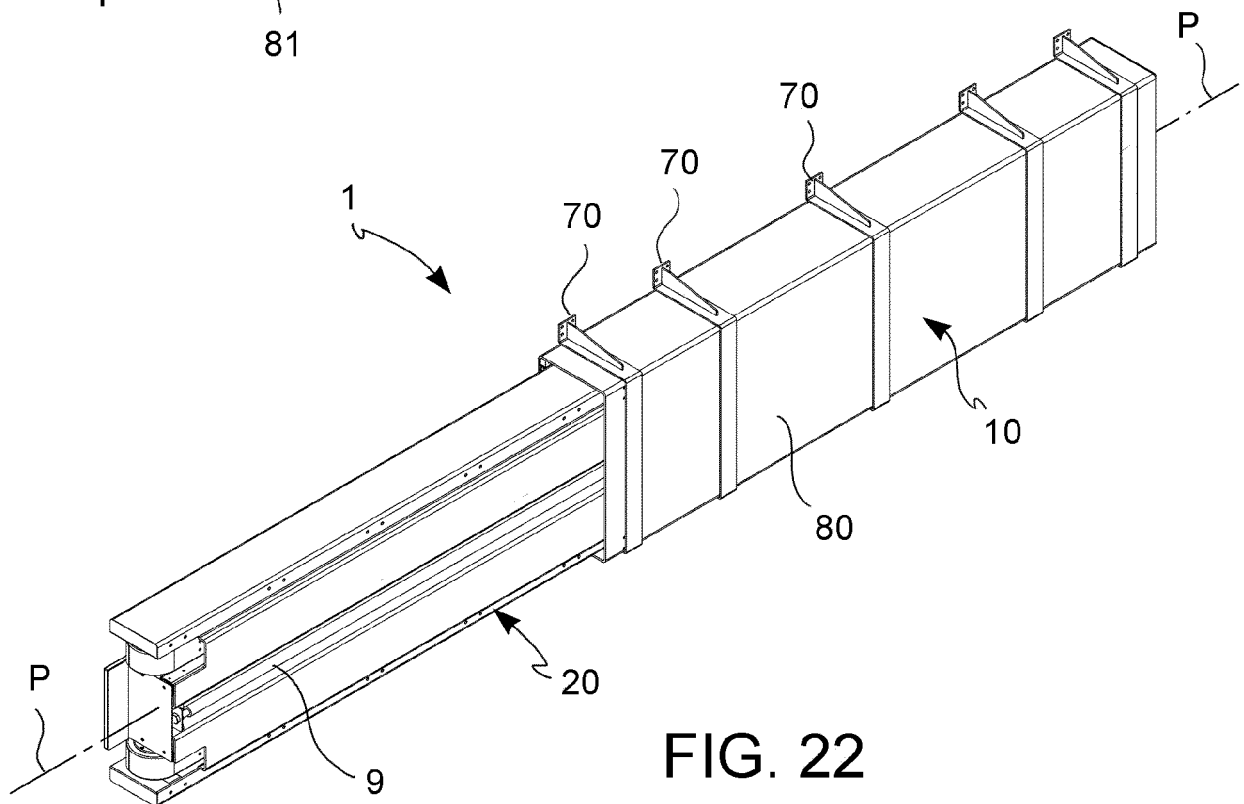
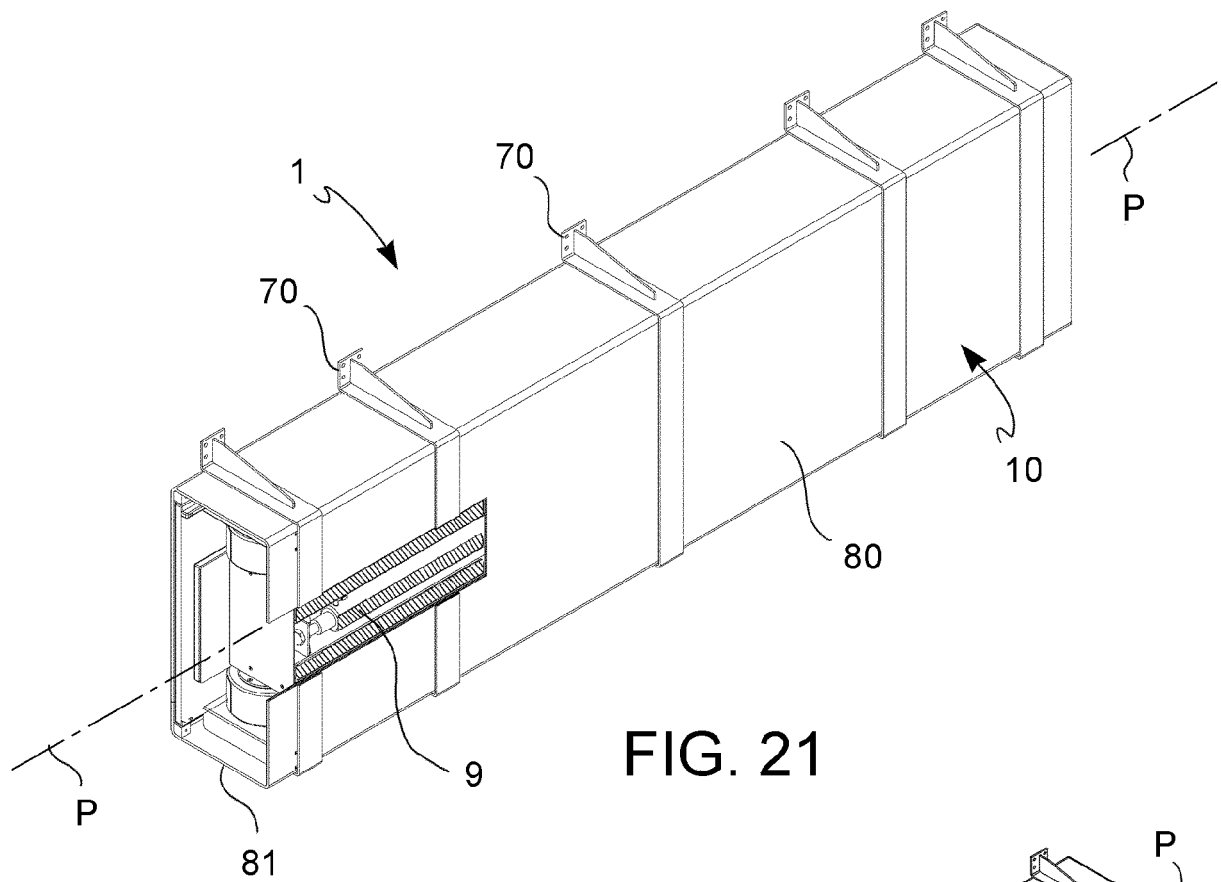


FIG. 20





EUROPEAN SEARCH REPORT

 Application Number
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A	* page 1, line 14 - line 18 * * page 7, line 1 - line 5 * * page 7, line 24 - line 27 * * figures 2,6,7 *	3-7,10, 12-17	
			TECHNICAL FIELDS SEARCHED (IPC)
			B63B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		20 November 2020	Barré, Vincent
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