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(54) Side service door for boats

(57) A side service door (1) for boats (B) comprising shaped shutter (2, 3) which is applied at a compartment (V) made in the hull (M) of the boat (B), operation means (4), operatively connected with the shaped shutter (2, 3), which are coupled with the hull (M) of the boat (B) and move the shaped shutter (2, 3) between at least one rest position, in which the shaped shutter (2, 3) is coplanar with the hull (M) of the boat (B) in order to close the compartment (V), and a working position in which the shaped shutter (2, 3) protrudes laterally from the hull (M) of the boat (B) along a substantially horizontal plane in order to open the compartment (V) and become a pattering and/or covering landing, opening the compartment (V). The operation means (4) include translation means (5) which move the shaped shutter (2, 3) between the rest position and the working position and vice versa, keeping the shaped shutter (2, 3) itself in substantially vertical position and facing the hull (M) of the boat (B).

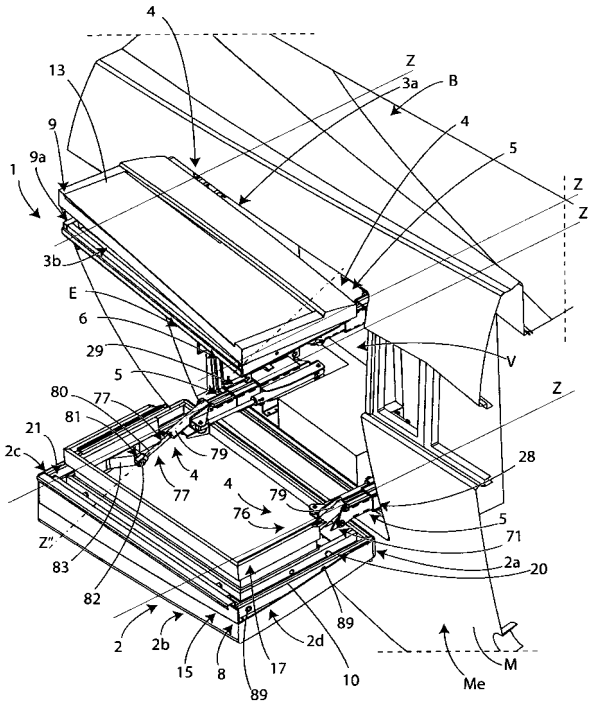


Fig. 2

EP 2 305 553 A1

Description

[0001] The present invention relates to a side service door for boats such as yachts, superyachts, or pleasure watercrafts in general.

[0002] In particular, in use condition, the side service door of the invention takes the configuration of a pattering and/or protection balcony, full of covering roof, arranged protruding from the hull of the boat mainly at personal shipowner's housing room.

[0003] As known, the most modern, sophisticated and generally luxurious pleasure watercrafts, such as yachts, superyachts, catamarans and the like, include a side service door which, normally, during voyage, closes a compartment made in the hull, at the cosiest and most glamorous indoor rooms or environments of the boats.

[0004] The side service door includes at least one shaped shutter equipped with an outer surface, usually and properly made of the same material of the wall or hull of the boat, such as plastic reinforced by incorporated fibreglass, which, when the door closes the compartment, makes continuous and uniform the hull itself, resulting coplanar with it.

[0005] This is due mainly to the fact that the outer surface of the shaped shutter is convex according to radius of curvature that exactly follows the radius of curvature of the parts of the hull adjacent to the compartment which receives the side door.

[0006] Usually, the side door service here at issue also includes a second shaped shutter, placed above the first shutter with which cooperates in order to close the compartment.

[0007] In particular, the second shaped shutter comprises a perimetric bearing frame supporting a panel made of transparent material, for example glass, in order to allow the view of the external environment to the persons who are inside the room of the boat.

[0008] If necessary, especially when boats are moored at the port or at open sea, the shaped shutters of the side door are moved in order to partly or completely open the compartment and allow the airing of the indoor rooms themselves.

[0009] When the opening of those shaped shutters of the side door is complete, each of them protrudes from the hull of the boat according to a substantially orthogonal plane or in any case incident the curved plane of the hull itself in order to define a support landing, provided with appropriate protective balustrade, and covering top respectively.

[0010] In practice, in such occasions, the first shaped shutter of the side door becomes a real balcony, overlooking and facing the sea, which can be trampled on by people in order to enjoy outdoors and seascape directly from the boat, while the second shaped shutter becomes a kind of roof, also projecting cantilevered from the hull of the boat and oriented on the sea, which shelters the persons occupying the balcony below from the atmospheric agents, such as bright sunshine.

[0011] So that it is possible, during the mooring, to provide any room of a boat with a balcony and, in general, at the same time, a roof above the balcony, allowing guests to access outside directly from such a room overlooking the sea in full comfort, the side service door includes operation means, operatively connected with the shaped shutters.

[0012] The operation means, coupled with the hull of the boat, more precisely contained inside the compartment made in it, move the shaped shutters between at least a rest position, in which the shaped doors are coplanar with the hull of the boat and close the compartment, and a working position, in which the shaped doors protrude laterally from the hull of the boat shaped according to substantially horizontal planes in order to become respectively a pattering landing and a covering landing and open the compartment.

[0013] Much briefly, when it is desired to transform the side service door in a balcony complete with roof, the operation means, properly driven by control means, such as a hydraulic control unit at user's disposal, overturn towards the outside the shaped shutters making them protruding from the hull of the boat.

[0014] Conversely, when it is desired to bring the shaped shutters again in the position of closing the compartment, the operation means rotates in opposite direction the shaped shutters, performing on them a kind of upward traction.

[0015] The movement of overturning and traction of the shaped shutters consists essentially in a rotation thereof around an axis defined by mechanical components placed on the lower edge of the perimetrical wall delimiting the compartment made in the boat and with which the side service door is associated.

[0016] Despite the undeniable functional effectiveness of the side service doors of the known type just described in short, they present, however, some acknowledged drawbacks.

[0017] The main drawback of the prior art in question derives from the complexity of the workings with which in the shipyard the compartment, able to allow that the shaped shutters coupled with it are free to rotate under the control of the operation means, as well as that their rotation occurs in a correct and appropriate manner, is obtained in the hull of the boat.

[0018] The workings for obtaining the aforesaid compartment, indeed, are not limited to a simple cutting of the hull of the boat at the prescribed area, as auspicious, but they also provide for the removal of additional material of the hull at the side wall delimiting the compartment to which the mechanical components defining the rotation centre of the shaped shutters are fixed.

[0019] These workings, beyond to affecting on the hydraulic seal at the area of the hull concerned by them and on the aesthetic effect of the same to such an extent as to require specially designed constructive remedies, inevitably imply a lengthening of the times of production in general, assembly of the side door in particular and,

ultimately, delivery, as well as higher production costs, the other factors involved in the calculation of the latter being equal.

[0020] A second drawback of the known technique treated therein is due to the fact that the construction design of the operation means that move the shaped shutters between the rest position and working position severely limits the versatility of the side service doors.

[0021] Indeed, at the current state of the art the side doors in exam can be applied only to straight parts of the hull of the boat and offer the manufacturer a range of constructive and applicative choices rather reduced which does not allow to meet particular tastes and needs of the end customer (the shipowner).

[0022] The present invention aims to overcome the drawbacks of the prior art just listed.

[0023] In particular, primary purpose of the current invention is to provide a side service door which compared to the prior art simplifies the workings to be performed for its installation on the hull of the boat.

[0024] In other words, the present invention proposes as main purpose to give substance to a side service door for boats which eliminates the need for removing material from the side wall delimiting the compartment with which the door itself is coupled, in addition to the cutting working of the hull necessary to get such a compartment.

[0025] Under this purpose, it is task of the invention to make available a side service door for boats which, compared to equivalent known doors, reduce time and cost for its installation.

[0026] Other task of the present invention is to provide a side service door which protects the structural integrity and aesthetic effect of the hull of the boat at the compartment to which is applied at an extent greater than the known technique, without the need for always undesired constructive remedies.

[0027] It is another purpose of the invention to develop a side service door which can be applied at any point of the hull of the boat, thus allowing, at design and installation step, to free the choices of the application area of the side door from the particular profile of the hull and extending the applicative versatility thereof compared to the known art.

[0028] These purposes are achieved through a side service door for boats, as to the attached claim 1, as hereinafter referred for the sake of brevity.

[0029] Other features of retail of the side service door of the invention are set forth in the corresponding dependent claims.

[0030] Advantageously, the side service door of the invention allows to simplify and minimize the workings to be performed at a shipyard in order to get in the hull of a boat the compartment to which the door itself must be applied.

[0031] This is a consequence of the fact that the operation means comprise translation means acting on the shaped shutter before its actual rotation, in the transition from the rest position to the working position, and after the rotation of the shutter, in the transition from the working position to the rest position.

[0032] In this way, the shaped shutter is driven to rotate always and only when it is positioned protruding and far away from the hull of the boat.

[0033] Thanks to the side door of the invention, therefore, it is not necessary to provide for further working, by removing material forming the hull, of the side wall delimiting the compartment in order to prevent interference during rotation between the side edge of the shaped shutter and such a side wall, because the rotation takes place when the shaped shutter is cantilevered after its removal from the hull and before its approach or hauling to the latter.

[0034] Still advantageously, the side door of the invention reduces time and cost of working and assembly compared to the equivalent known doors.

[0035] Equally advantageously, the non-execution of further excavation workings on the hull creates a seal against water entry into the compartment to which the side service door of the invention is applied greater than that one offered by similar already known doors.

[0036] Moreover, in advantageous manner, the side service door here claimed can be applied to any area of the hull of the boat, abaft as well as at prow, and not exclusively only to the straight areas of the profile of such a hull, as it currently happens.

[0037] It is obvious that this aspect, always resulting from the fact that the operation means include the translation means, provide an increased flexibility in design and installation phase that allows to meet new and felt requirements among the final customers and that, as such, is highly appreciated and distinctive.

[0038] Said purposes and advantages will be better known from the following description referring to a preferred embodiment of the side service door for boats of the invention, given as illustrative and indicative, but not be limited, title in relation to the accompanying drawings where:

- figure 1 is an assonometric view of the side door of the invention in a first operating position and conditions of application of the boat, shown partly;
- figure 2 is a assonometric view of the side door of figure 1 in a second operating position;
- figure 3 is the simplified and part assonometric view of the side door of the invention in the operating position of figure 2;
- figure 4 is the complete assonometric view of the side door of the invention in the final operative configuration;
- figure 5 is a side view of figure 4;
- figure 6 is an assonometric view of a first constructive assembly of figure 4;
- figure 7 is a rear assonometric view of the constructive assembly of figure 6;
- figure 8 is an enlarged detail of figure 6;
- figure 9 is an assonometric view of a first constructive

component of figures 6 and 7 in the configuration defining the second operating position of figure 2;

- figure 10 is the assonometric view of a second constructive component of figures 6 and 7 in the configuration defining the second operating position of figure 2.

[0039] The side service door is illustrated in figures 1-3, where it is globally numbered with 1, in applicative conditions, installed on a boat B, such as a yacht, shown only partly.

[0040] As it can be seen, the side door 1 comprises:

- a pair of shaped shutters 2, 3 applied at a compartment V made in the hull M of the boat B;
- operation means, on the whole numbered with 4, operatively connected with the shaped shutters 2, 3 and coupled with the hull M of the boat B, in this case inside the compartment V, which move the shaped shutters 2, 3 between at least a rest position (shown in figure 1) in which the shaped shutters 2, 3 are coplanar with the hull M of the boat B to close the compartment V, and a working position (shown in figure 2), in which the shaped shutters 2, 3 protrude laterally from the hull M of the boat B according to substantially horizontal planes in order to become, respectively, a pattering landing and a covering landing and open the compartment V.

[0041] According to the invention, the operation means 4 include translation means, as a whole indicated with 5, which move the shaped shutters 2, 3 between the rest position and the working position and vice versa keeping them in an almost vertical position, facing the hull M of the boat B.

[0042] Preferably but not necessarily, the side door service 1 includes control means available to the operator, not represented for the sake of exposition and for example consisting of a hydraulic control unit, operatively connected with the operation means 4 in order to manage the operation thereof.

[0043] More precisely, the control means are arranged in a room of the boat B, for example, the room for shipowner's personal use.

[0044] As it will be explained later on, coupling between side door 1 and hull M of the boat B, caused by the operation means 4, is such that, while the shaped shutters 2, 3 move, their side edge 2a, 3a closer to the hull M does not interfere at all with the hull M itself.

[0045] Moreover, in the working position the side edge 2a, 3a is spaced from the side directly facing the hull M.

[0046] In particular, in the working position, the shaped shutter 2, placed below the shaped shutter 3, becomes a pattering platform like a balcony, while the shaped shutter 3 takes the form of roof or cantilever roof which shelters from the atmospheric agents people who, coming out of a local of the boat B through the compartment V, occupy the pattering platform below.

[0047] In the rest position, both the shaped shutters 2, 3 contribute to the closure of the compartment V, positioning coplanar each other and one close to another at the respective side edge 2b, 3b opposite to the lateral edge 2a, 3a.

[0048] In a preferred but not exclusive manner, the side door 1 includes a perimetric frame, overall indicated with 6, fixed to the inner wall of the compartment V at its inlet E.

[0049] The perimetric frame 6 is provided with sealing means, better visible in figure 3 where they are generally indicated with 7, contained into a perimetric groove, not shown, made in the perimetric frame 6 from which partly protrude.

[0050] In their rest position before introduced, the shaped shutters 2, 3 are positioned close to such a perimetric frame 6.

[0051] The sealing means 7 comprise, in this case, a silicone rubber gasket fitted inside the perimetric groove of the perimetric frame 6.

[0052] It is understood that in other embodiments of the invention, the sealing means may be different from that ones just described and may comprise, for example, an inflatable chamber properly filled with compressed air.

[0053] Each of the shaped shutters 2, 3 presents in this case, purely by way of example, a substantially rectangular profile.

[0054] Each of the shaped shutters 2, 3 preferably includes:

- a bearing framework 8, 9 on a first perimetric stretch of the side surface 8a, 9a provided with a wedge-shaped profile 10, 11 which, in the rest position of the respective shaped shutter 2, 3, is forced against the sealing means 7 so as to prevent or minimize water entry into the compartment V through the inlet E;
- a finishing panel 12, 13, coupled with the relative bearing framework 8, 9, in the rest position contained in the compartment V and in the working position defining the pattering landing and the covering landing.

[0055] More in detail, in the working position, the finishing panel numbered with 12, visible only in figure 4, defines the pattering landing or platform, while the finishing panel 13 defines the covering landing o roof.

[0056] The finishing panel 12 matches in thickness and aesthetic features the surface coating of the inner room of the boat B to which overlooks in the rest position and is also suitable to be trampled in the working position.

[0057] The finished panel 13, instead, consists of a classic slab made of transparent material, such as glass, which allows the view of the external environment when the shaped shutter 3 is in the rest position.

[0058] The only shaped shutter 2 also comprises an outer laminar finishing panel, shown in figure 1 where it is indicated with 14, coupled with the bearing framework 8 from the opposite side of the finishing panel 12 and

made of the same material of the hull M of the boat B, such as plastic reinforced by incorporated fibreglass.

[0059] In the rest position, the external surface 14a of the outer laminar finishing panel 14 remains visible from the outside, resulting coplanar with the outer wall M_e of the hull M of the boat B.

[0060] With reference to the bearing framework 8 associated with the shaped shutter 2, as highlighted by figures 2 and 3, it consists of a main structure 15, provided with a plurality of reinforcement blades 16 facing and side-by-side each other, with which the outer laminar finishing panel 14 is coupled.

[0061] The bearing framework 8 is also composed of a secondary structure 17, directly supporting the shaped shutter 2 and contained in the overall dimensions defined by the main structure 15 to which it is fixed.

[0062] Advantageously, the side door 1 of the present invention also includes an additional panel 18, visible only in figure 4, which, in the working position of the shaped shutter 2, is coplanar with the finishing panel 12 and interposed on one side between the latter and the pattering deck of the inner room of the boat B and on the other side between the translation means 5.

[0063] In essence, the additional panel 18 creates a structural continuity between the pattering deck inside the room of the boat B and the pattering landing offered by the finishing panel 12 of the shaped shutter 2: said structural continuity ensures to people safety conditions in the transition from the inner room of the boat B to the shaped shutter 2 arranged in the working position, protruding cantilevered from the hull M.

[0064] In this connection, the shaped shutter 2 also includes protection means, overall marked with 19 in figure 4, cooperating with driving means, visible in figure 2 where they are as whole numbered with 20, connected with the general control means.

[0065] The driving means 20 move the protection means 19 from a passive position (shown in figure 2), in which they are totally contained into a narrow seat 21 present in a second perimetric stretch of the side surface casing 8a of the bearing framework 8, to an active position (shown in figures 4, 5) in which the protection means 19 emerge upwardly from the bearing framework 8 forming a service parapet after the shaped shutter 2 has taken the working position.

[0066] Obviously, the driving means 20 move the protection means 19 in direction opposite to that one described above, namely from the active position to the passive position, before the shaped shutter 2 takes the rest position of figure 1.

[0067] The second perimetric stretch is inside and partly side-by-side to the first perimetric stretch of the side surface 8a and corresponds to the side edge 2b, 2c and 2d of the shaped shutter 2 facing the outside when the shutter 2 itself is, cantilevered, in the working position.

[0068] At preferential title, the protection means 19 include a plurality of support stanchions 22 made of metallic material, each of which operatively connected with the driving means 20 and consisting of two identical bars 23, 24 interconnected each other through pivot means, as a whole indicated with 25 and of known type.

[0069] Moreover, the protection means 19 include a series of transverse section bars 26 made of metallic material which connect the support stanchions 22 each other.

[0070] In turn, the driving means 20 comprise in this case a group of small fluid dynamic cylinders coupled internally with the bearing framework 8 of the shaped shutter 2, in particular with the outer wall 17a of the secondary structure 17.

[0071] Henceforth, and until otherwise specified, the description of the invention will continue with specific and exclusive reference to the shaped shutter 2, meaning what said for it valid and applicable also for the shaped shutter 3.

[0072] According to the preferred embodiment of the invention described herewith, the translation means 5 comprise, as it can be observed in figures 6, 7 and 8:

- a pair of telescopic arms 28, 29 coupled with a limited portion of the inner wall delimiting the compartment V of the boat B and defining longitudinal directions Z parallel and spaced each other, incident the lateral face of the shaped shutter 2 before the latter takes the working position;
- a pair of first linear actuators 30, 31, one for each of the telescopic arms 28, 29 with which is coupled, connected with the control means and acting on the telescopic arms 28, 29 in order to move the shaped shutter 2 from the rest position to the working position and vice versa.

[0073] In detail, each telescopic arm 28, 29 includes:

- a fixed protection bowl 32 firmly coupled with the inner wall of the compartment V through fastening means, on the whole indicated with 33;
- a plurality of tubular bodies 34 sliding one with respect to another along the longitudinal directions Z and coupled each other through first guide means, overall indicated with 35, completely contained into the protection bowl 32 in the aforesaid rest position, the main tubular body 34 having sizes greater than the secondary tubular bodies 34, being coupled with the protection bowl 32 through second guide means, throughout numbered with 36.

[0074] In a preferred but not binding way, as better illustrated in figure 9, the first guide means 35 comprise a pair of first linear slots 37, 38 made in the external wall 34a of some of the secondary tubular bodies 34, and a pair of second linear slots 39, 40 made in the internal wall, not indicated, of some of the tubular bodies 34 in order to face the first linear slots 37, 38 of the tubular body 34 adjacent to it.

[0075] In this case, the smallest tubular body 34

presents only one first linear slot 41 in the external wall 34a, while the tubular body 34 immediately preceding it presents only a second linear slot 42 in the internal wall.

[0076] The guide means 35 also comprise a pair of laminar sliding blocks 43, 44, inserted into the first linear slots 37, 38 and second linear slots 39, 40 and a single laminar sliding block 45 inserted into the linear slots 41, 42.

[0077] The laminar sliding blocks 43, 44 and 45 are made, for example, of thermoplastic resin such as polyethyleneterephthalate (PET acronym).

[0078] It is understood that, in further embodiments of the invention, not shown hereinafter, the number of first and second linear slots for each tubular body and, consequently, laminar sliding blocks will be different from that one just indicated, this number could vary depending on the needs starting from one.

[0079] The second guide means 36 comprise, instead, a longitudinal notch, not visible, made in the external wall 34a of the main tubular body 34, and a pair of longitudinal rods 46, 47 fixed from opposite sides to the inner side surface 32a of the protection bowl 32.

[0080] As far as the fastening means 33 are concerned, they include, as it well observes from figures 6 and 7:

- a laminar base plate 48 having a bottom face which is positioned close to the inner wall of the compartment V;
- a plurality of first screw means 49, inserted into a plurality of as many first through holes, not shown for the sake of exposition simplicity, made in the laminar plate 48 and a plurality of second through holes 27, made in a pair of backstays 50, 51 symmetrically opposed each other, belonging to the protection bowl 32 and placed close to the upper face 48a of the laminar plate 48;
- a plurality of second screw means, not shown, inserted into a plurality of as many third through holes 52 made in the laminar plate 48, used to make the laminar plate 48 integral with the inner wall of the compartment V.

[0081] Each of the first linear actuators 30, 31 previously mentioned comprises a fluid dynamic cylinder 53, put beside the respective telescopic arm 28, 29 and provided with an external liner 54 having an end tied to a support plate 55 fixed to the outer side surface 32b of the protection bowl 32.

[0082] The fluid dynamic cylinder 53 is also provided with a strength stem 56, sliding inside the external liner 54 along a longitudinal axis Z' substantially parallel to the longitudinal direction Z and having one end 56a tied to support means, as a whole marked with 57, arranged at the free end 34b of the smallest tubular body 34 of each of the telescopic arms 28, 29.

[0083] In this case, the support means 57 comprise a first pin 58, coupled with the end 56a of the strength stem 56 along a first linear axis Y orthogonal to the longitudinal axis Z' of the strength stem 56, and a pair of locking elements 59, 60, with which the first pin 58 is coupled.

[0084] The locking elements 59, 60 are made integral, for example by means of a welding seam, with a first shaped appendix 61 projecting along the longitudinal direction Z from the smallest tubular body 34 of each of the telescopic arms 28, 29.

[0085] Figure 10 shows an enlargement of the telescopic arm 62 with which the translation means 5 move the shaped shutter 3 between the rest position and the working position and vice versa.

[0086] It has to be noted that the structure of the telescopic arm 62, and the telescopic arm 63 equal and opposite to it, is almost totally equivalent to that one of the telescopic arms 28, 29.

[0087] The only distinction component element concerns the support means, as a whole indicated with 66 and shown in figures 3 and 4, which bind the end 65a of the strength stem 65 of the fluid dynamic cylinder 64.

[0088] In particular, the support means 66 comprise a first pin 67, coupled with the end 65a of the strength stem 65 along a first linear axis X still orthogonal to the longitudinal axis Z' of the strength stem 65 but according to a spatial orientation orthogonal even to the first longitudinal axis Y of the first pin 58.

[0089] Beyond this, the support means 66 include a single locking element 68 which, thanks to the first pin 67, is made integral with a pair of first shaped appendixes 69, 70, better seen in figure 9, protruding along the longitudinal direction Z from the smallest tubular body 34 of each of the telescopic arms 62, 63.

[0090] Suitably, the operation means 4 comprise rotation means, globally indicated with 71 and visible in figures 2-5, operatively connected with the shaped shutters 2, 3 and the translation means 5.

[0091] The rotation means 71 move angularly the shaped shutters 2, 3, acting after the translation means 5 when the shutters 2, 3 are moved from the rest position to the working position, and before the translation means 5 when the shutters 2, 3 are moved from the working position to the rest position.

[0092] As previously made for the translation means 5, even for the rotation means 71 the present patent description will proceed, until otherwise specified, with specific reference to the shaped shutter 2, meaning what said fro it valid and applicable for the shaped shutter 3 too.

[0093] Preferably but not necessarily, the rotation means 71 comprise in this case a pair of second pins spaced apart each other, defining a common longitudinal rotation axis K perpendicular to the longitudinal axis Z' of the strength stem 56 and, incidentally, the longitudinal axis Y of the only first pin 58.

[0094] Figures 2-5 show only one of the second rotation pins, indicated with 72, belonging to the rotation means 71 which act on the shaped shutter 2.

[0095] Each of the second pins is coupled with the first shaped appendix 61, the second shaped appendix 73,

opposite to and spaced apart from the first shaped appendix 61 of each telescopic arm 28, 29, as well as with a pair of connecting brackets 74, 75, facing the shaped appendixes 61, 73 and fixed to the bearing framework 8 of the shaped shutter 2.

[0096] The rotation means 71 also comprise a pair of second linear actuators 76, 77, one for each of the telescopic arms 28, 29 and first linear actuators 30, 31, connected with the control means and coupled with the telescopic arms 28, 29 and shaped shutter 2.

[0097] As for the first actuators 30, 31, event each of the second linear actuators 76, 77 includes in preferred though not exclusive way a fluid dynamic piston 78 provided with:

- an external liner 79 having one end tied to the first shaped appendix 61 and second shaped appendix 73;
- a strength stem 80, sliding inside the external liner 79 along a longitudinal axis Z" which, in the working position, defines an acute angle with the longitudinal axis Z' of the strength stem 56 of the fluid dynamic cylinder 53 and presents an end tied to strike means, on the whole indicated with 81, coupled with the inner wall 17b of the secondary structure 17 of the bearing framework 8 of the shaped shutter 2.

[0098] In particular, the strike means 81 comprise a third pin 82, coupled with an end of the strength stem 80 defining a second linear axis X' parallel to the longitudinal rotation axis K of the second pins, and a locking plate 83 integral with the inner wall 17b of the secondary structure 17 of the bearing framework 8 of the shaped shutter 2.

[0099] Figures 4 and 5 highlight also that, advantageously, the side service door 1 comprises security means, as a whole numbered with 84, coupled with the perimetric frame 6, cooperating with the shaped shutter 2 in the rest position in order to keep such a position in which it results, as mentioned, coplanar with the hull M of the boat B.

[0100] By way of example, the security means 84 include:

- two pairs of auxiliary fluid dynamic cylinders 85, connected with the control means, equally divided on two vertical uprights 86, 87 opposite each other of the perimetric frame 6 with which are coupled through support means, overall indicated with 88 and for example consisting of a rectangular plate firmly coupled with each vertical upright 86, 87;
- two pairs of blind openings 89, equally made in two side portions 90, 91 of the outer surface of the primary structure 15 of the bearing framework 8, each of which, in the rest position, coaxially facing one of the auxiliary fluid dynamic cylinders 85 in order to be engaged by the free end of the related movable stem, not visible.

[0101] Other embodiments of the invention, not followed by the reference drawings, will provide that the security means just indicated comprise only one or more than two pairs of auxiliary fluid dynamic cylinders and consequent blind openings, equally divided on the vertical uprights of the perimetric frame and side portions of the bearing framework casing respectively.

[0102] In further embodiments of the invention, not shown, the security means could even or exclusively cooperate with both shaped shutters or only with the upper shaped shutter.

[0103] Furthermore, in advantageous manner, the side service door of the invention also comprises release means, not shown, at user's disposal, adapted to act on the security means 84 in case malfunctioning or functioning failure, such as for instance a long electricity lacking, by the side door 1 when the shaped shutters 2, 3 are in the rest position and close the compartment V.

[0104] This in order to release the shaped shutters 2, 3 from the security means 84 and allow the shaped shutters 2, 3 themselves to be manually moved towards the working position illustrated in figures 2-5.

[0105] The release means comprise, for example, a fork wrench or of metric or Anglo-Saxon type which the operator manoeuvres onto a square end of the movable stem protruding from the outer cylinder up to the point of totally extracting from the latter the movable stem of the auxiliary fluid dynamic cylinders 85.

[0106] In use, the user, when he wishes to enjoy the open air by overlooking the water basin directly from the local of the boat B, drives the control means firstly releasing the shaped shutter 2 from the security means 84 and subsequently activating the operation means 4 and, in particular, in the initial phase, the translation means 5.

[0107] The movement of the translation means 5 allows to push out the side service door 1, spreading it apart from the hull M of the boat B: the shaped shutters 2, 3, thus pass from the rest position, shown in figure 1, to a position, not shown in the accompanying drawings, in which they are substantially in a vertical position, facing the hull M itself.

[0108] After the stroke of the translation means 5 along the longitudinal direction Z, the user, always through the control means, drives the rotation means 71 firstly rotating clockwise the shaped shutter 3 and then rotating anticlockwise the shaped shutter 2.

[0109] In this way, the rotation of the shaped shutters 2, 3 around the longitudinal axis K occurs far away from the boat B, without the respective side edge 2b, 3b of the same in any way interferes with the hull M.

[0110] At the end of the rotation, the shaped shutters 2, 3 are in the working position shown in figures 2 and 3, arranged according to a plane substantially orthogonal to the hull M of the boat B, and the compartment V is completely open.

[0111] In particular, the shaped shutter 2 defines a pattering landing or platform, while the shaped shutter 3 defines a covering landing or roof.

[0112] Finally, the user operates small fluid dynamic cylinders of the driving means 20 in order to move the protection means 19 from the passive position to the active position and get so a parapet which defines the final configuration of the side service door 1, shown in figures 4 and 5.

[0113] In such a configuration, people can go outdoors, I absolute security, directly from the inner room of the boat B which gives shelter to them and which is perimetrically delimited even by the side service door 1 during, for example, the normal navigation.

[0114] At the time when the user desires to bring the side service door 1 again at closure of the compartment V, according to the position shown in figure 1, he firstly drives the rotation means 71 so as to rotate along the longitudinal axis K in the order, the shaped shutter 2 (clockwise) and the shaped shutter 3 (anticlockwise) until to place them in the vertical position, facing the hull M of the boat B even though still spaced apart from it.

[0115] Once the aforesaid rotation is concluded, the user then moves the translation means 5 in such a way as the tubular bodies 34 of the telescopic arms 28, 29, 62, 63 enter again into each other and the last into the protection bowl 32 by sliding along the longitudinal direction Z in direction opposite to the previous one.

[0116] Simultaneously, the shaped shutters 2, 3 are brought nearer to the hull M of the boat B up to be placed close to the perimetric frame 6, position in which the wedge-shaped section bar 10, 11 is forced against the silicone seal of the sealing means 7 in order to ensure maximum protection conditions against water entry into the compartment V.

[0117] Finally, the user again drives the security means 84 by inserting the free end of the movable stem of the auxiliary fluid dynamic cylinders 85 into the corresponding blind openings 89 present in the side portion 90, 91 opposite each other of the outer surface of the primary structure 15 of the bearing framework 8.

[0118] By virtue of the foregoing, it is understood, therefore, that the side service door for boats reaches the purposes and achieves the advantages previously mentioned.

[0119] The drive system of the side service door 1 of the invention, including the translation means 5, can be suit for both straight hulls and oblique hulls of the boat and can be conveniently installed near the prow.

[0120] The side service door 1 of the invention presents an easy installation, extremely easier and quicker than equivalent doors of the known type, taking into account also and especially the workings which must be performed at the shipyard to get the compartment V for the application of the door 1.

[0121] In execution phase, changes could be made to the side service door for boats of the invention consisting of, for example, translation means different from those previously described with reference to the drawings that follow.

[0122] In addition, in other embodiments of the invention, the side service door could include instead of two shaped shutters a single shaped shutter, operatively connected with the operation means and able to completely close the compartment made in the hull of the boat.

[0123] It is finally clear that many other variations may be made to the side service door in question, without departing from the principle of novelty intrinsic in the inventive idea expressed here, as it is clear that, in the practical implementation of the invention, materials, shapes and sizes of the illustrated details can be changed, as needed, and replaced with others technically equivalent.

[0124] Where the constructive features and techniques mentioned in the following claims are followed by reference numbers or signs, those reference signs have been introduced with the sole objective of increasing the intelligibility of the claims themselves and therefore they have no limiting effect on the interpretation of each element identified, by way of example only, by these reference signs.

Claims

1. Side service door (1) for boats (B) comprising:

   - at least one shaped shutter (2, 3) suitable to be applied in correspondence of a compartment (V) made in the hull (M) of the said boat (B);
   - operation means (4), operatively connected with said shaped shutter (2, 3), suitable to be coupled with said hull (M) of said boat (B) and move said shaped shutter (2, 3) between at least one rest position, in which said shaped shutter (2, 3) is coplanar with said hull (M) of said boat (B) in order to close said compartment (V), and a working position in which said shaped shutter (2, 3) protrudes laterally from said hull (M) of said boat (B) along a substantially horizontal plane in order to open said compartment (V) and become a pattering and/or covering landing,

   characterized in that said operation means (4) include translation means (5) suitable to move said shaped shutter (2, 3) between said rest position and said working position and vice versa keeping said shaped shutter (2, 3) in substantially vertical position and facing said hull (M) of said boat (B).

2. Door (1) as claim 1) **characterized in that** it includes control means at operator's disposal, operatively connected with said operation means (4) in order to manage the functioning thereof.

3. Door (1) as any of the previous claims **characterized in that**, during the moving of said shaped shutter (2, 3), the side edge (2a, 3a) of said shaped shutter (2, 3) closer to said hull (M) of said boat (B) does not

interfere with said hull (M) and is directly facing and spaced from said hull (M) in said working position.

4. Door (1) as any of the previous claims **characterized in that** said translation means (5) comprise:

- a pair of telescopic arms (28, 29, 62, 63) suitable to be coupled with a limited portion of the inner wall delimiting said compartment (V) of said boat (B) and defining a longitudinal direction (Z) parallel and space each other and substantially incident the lateral face of said shaped shutter (2, 3) before said shaped shutter (2, 3) assumes said working position;
- a pair of first linear actuators (30, 31), one for each of said telescopic arms (28, 29) with which is coupled, connected with said control means and suitable to act on said telescopic arms (28, 29, 62, 63) so as to move said shaped shutter (2, 3) from said rest position to said working position and vice versa.

5. Door (1) as claim 4) **characterized in that** each of said telescopic arms (28, 29, 62, 63) comprises:

- a fixed protection bowl (32), suitable to be firmly coupled with said inner wall of said compartment (V) through fastening means (33);
- a plurality of tubular bodies (34) sliding one with respect to another along said longitudinal direction (Z) and coupled each other through first guide means (35) fully contained into said protection bowl (32) in said rest position, the main tubular body (34) having sizes greater than the secondary tubular bodies (34), being coupled with said protection bowl (32) through second guide means (36).

6. Door (1) as claim 5) **characterized in that** these first guide means (35) include:

- at least a first linear slot (37, 38, 41) made in the external wall (34a) of each of said tubular bodies (34);
- at least a second linear slot (39, 40, 42) made in the internal wall of each of said tubular bodies (34) in order to face said first linear slot (37, 38, 41) of one of said tubular bodies (34) adjacent to it;
- at least one laminar sliding block (43, 44, 45) inserted into said first linear slot (37, 38, 41) and said second linear slot (39, 40, 42).

7. Door (1) as claim 5) or 6) **characterized in that** said fastening means (33) include:

- a flat base plate (48) having the lower face suitable to be disposed close to said inner wall of said compartment (V);
- a plurality of first screw means (49) inserted into a plurality of first through holes made in said laminar plate (48) and into a plurality of second through holes (27), coaxial with said first through holes, made in a pair of backstays (50, 51) opposite each other belonging to said protection bowl (32) and placed close to the upper face (48a) of said laminar plate (48);
- a plurality of second screw means inserted into a plurality of third through holes (52) made in said laminar plate (48), suitable to make said laminar plate (48) integral with said inner wall of said compartment (V).

8. Door (1) as any of the claims from 5) to 7) **characterized in that** each of said first linear actuators (30, 31) includes a fluid dynamic cylinder (53), put beside one of said telescopic arms (28, 29, 62, 63) and provided with:

- an external liner (54) having an end tied to at least one support plate (55) fixed to the outer side surface (32b) of said protection bowl (32);
- a strength stem (56, 65), sliding inside said external liner (54) along a longitudinal axis (Z') substantially parallel to said longitudinal direction (Z) and having an end (56a, 65a) tied to support means (57, 66), arranged at the free end (34b) of the smallest tubular body (34) of each of said telescopic arms (28, 29).

9. Door (1) as claim 8) **characterized in that** said support means (57, 66) comprise a first pin (58, 67), coupled with said ends (56a, 65a) of said strength stem (56, 65) along a first linear axis (Y, X) orthogonal to said longitudinal axis (Z') of said strength stem (56, 65), and at least one locking element (59, 60, 68), with which said first pin (58, 67) is coupled, integral with at least a first shaped appendix (61, 69, 70) projecting along said longitudinal direction (Z) from said smallest tubular body (34) of each of said telescopic arms (28, 29).

10. Door (1) as any of the claims from 2) to 9) **characterized in that** it includes a perimetric frame (6), suitable to be fixed to the inner wall of said compartment (V) at the inlet (E) of said compartment (V), equipped with a sealing means (7) contained into a perimetric groove made in said perimetric frame (6) from which they partially protrude, said shaped shutter (2, 3) being positioned close to said perimetric frame (6) in said rest position.

11. Door (1) as claim 10) **characterized in that** said shaped shutter (2, 3) comprises:

- a bearing framework (8, 9), on a first perimetric

stretch of the side surface (8a, 9a) provided with a wedge-shaped section bar (10, 11) which, in said rest position of said shaped shutter (2, 3), is forced against said sealing means (7) in order to prevent or minimize water entry into said compartment (V) through said inlet (E);

- a finishing panel (12, 13), coupled with said bearing framework (8, 9), contained into said compartment (V) in said rest position and forming said pattering and/or covering landing in said working position.

12. Door (1) as claim 11) **characterized in that** said shaped shutter (2) includes protection means (19) cooperating with driving means (20) connected with said control means and suitable to move said protection means (19) to/from a passive position, in which they are fully contained into a narrow seat (21) present in a second perimetric stretch of said side surface (8a) of said bearing framework (8), said second stretch corresponding to the side edge (2b , 2c, 2d) of said shaped shutter (2) facing the outside when said shaped shutter (2) is in said working position, to/from an active position in which said protection means (19) emerge upwardly from said bearing framework (8) forming a service parapet after said shaped shutter (2) has taken said working position.

13. Door (1) as claim 12) **characterized in that** said protection means (19) includes a plurality of support stanchions (22), each of which operatively connected with said driving means (20) and consisting of two identical bars (23, 24) interconnected each other through pivot means (25), and a plurality of transverse section bars (26) which connect said support stanchions (22) each other.

14. Door (1) as claim 12) or 13) **characterized in that** said driving means (20) comprise a group of small fluid dynamic cylinders coupled internally with said bearing framework (8) of said shaped shutter (2).

15. Door (1) as any of the previous claims **characterized in that** said operation means (4) comprise rotation means (71), operatively connected with said shaped shutter (2, 3) and said translation means (5), suitable to angularly moving said shutter (2, 3), acting after said translation means (5) when said shutter (2, 3) is moved from said rest position to said working position, and before said translation means (5) when said shutter (2, 3) is moved from said working position to said rest position.

16. Door (1) as claim 15) **characterized in that** said rotation means (71) comprise:

- a pair of second pins (72) spaced apart each other, defining a common rotation axis (K) orthogonal to said longitudinal axis (Z') of said strength stem (56, 65) and each coupled with said first shaped appendix (61, 69), a second shaped appendix (73, 70), opposite to and spaced apart from said first shaped appendix (61), and a pair of connecting brackets (74, 75), facing said shaped appendixes (61, 73, 69, 70) and fixed to said bearing framework (8, 9) of said shaped shutter (2, 3);
- a pair of second linear actuators (76, 77), one for each of said telescopic arms (28, 29, 62, 63) and said first linear actuators (30, 31), connected with said control means and coupled with said telescopic arms (28, 29, 62, 63) and said shaped shutter (2, 3).

17. Door (1) as claim 16) **characterized in that** each of said second linear actuators (76, 77) includes a fluid dynamic piston (78) provided with:

- an external liner (79) having one end tied to said shaped appendixes (61, 73, 69, 70);
- a strength stem (80), sliding inside said external liner (79) along a longitudinal axis (Z") which, in said working position, defines an acute angle with said longitudinal axis (Z') of said strength stem (56) of said fluid dynamic cylinder (53) and having an end tied to strike means (81), placed on the inner surface of said bearing framework (8, 9) of said shaped shutter (2, 3).

18. Door (1) as claim 17) **characterized in that** said strike means (81) includes a third pin (82), coupled with an end of said strength stem (80) defining a second linear axis (X') parallel to said longitudinal axis (K) of said second pins (72), and a locking plate (83) integral with said inner surface of said bearing framework (8, 9) of said shaped shutter (2, 3).

19. Door (1) as any of the claims from 10) to 18) **characterized in that** it comprises security means (84), coupled with said perimetric frame (6), cooperating with said shaped shutter (2) in said rest position in order to firmly keep it coplanar with said hull (M) of said boat (B).

20. Door (1) as claim 19) **characterized in that** said security means (84) include:

- at least one pair of auxiliary fluid dynamic cylinders (85), connected with said control means, equally divided on two vertical uprights (86, 87) opposite each other of said perimetric frame (6) with which are coupled through support means (88);
- at least a couple of blind openings (89), made in two side portions (90, 91) of the outer surface

of said bearing framework (8), each of which, in said rest position, coaxially facing one of said auxiliary fluid dynamic cylinders (85) to be engaged by the free end of the movable stem of one of said auxiliary fluid dynamic cylinders (85).

21. Door (1) as claim 19) or 20) **characterized in that** it includes release means available to the user, suitable to cat on said security means (84) in case of malfunctioning or functioning failure of said side door (1) when said shaped shutter (2) is in said rest position in order to release said shaped shutter (2) from the hooking of said security means (84) and allow said shaped shutter (2) to be manually moved toward said working position.

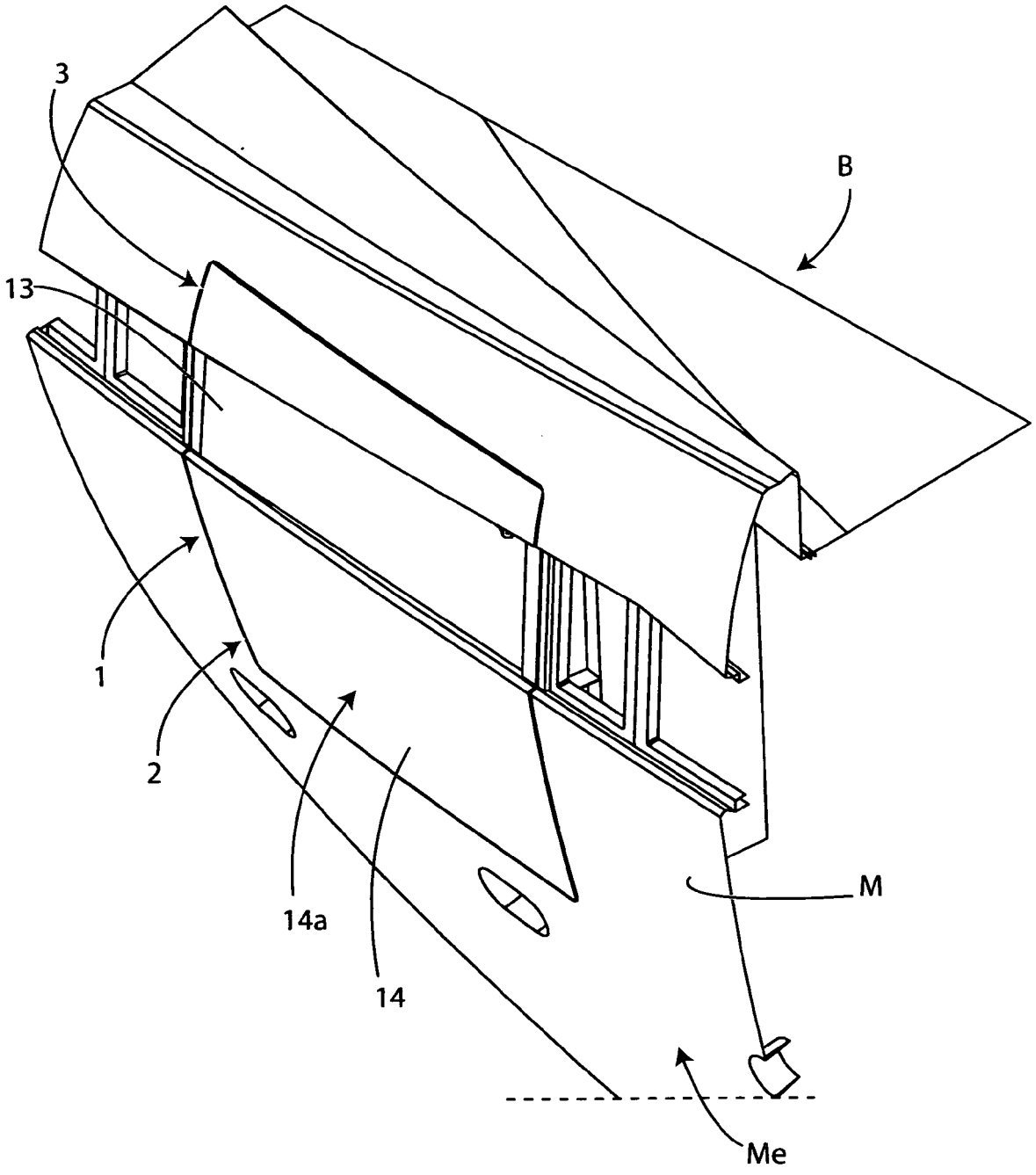
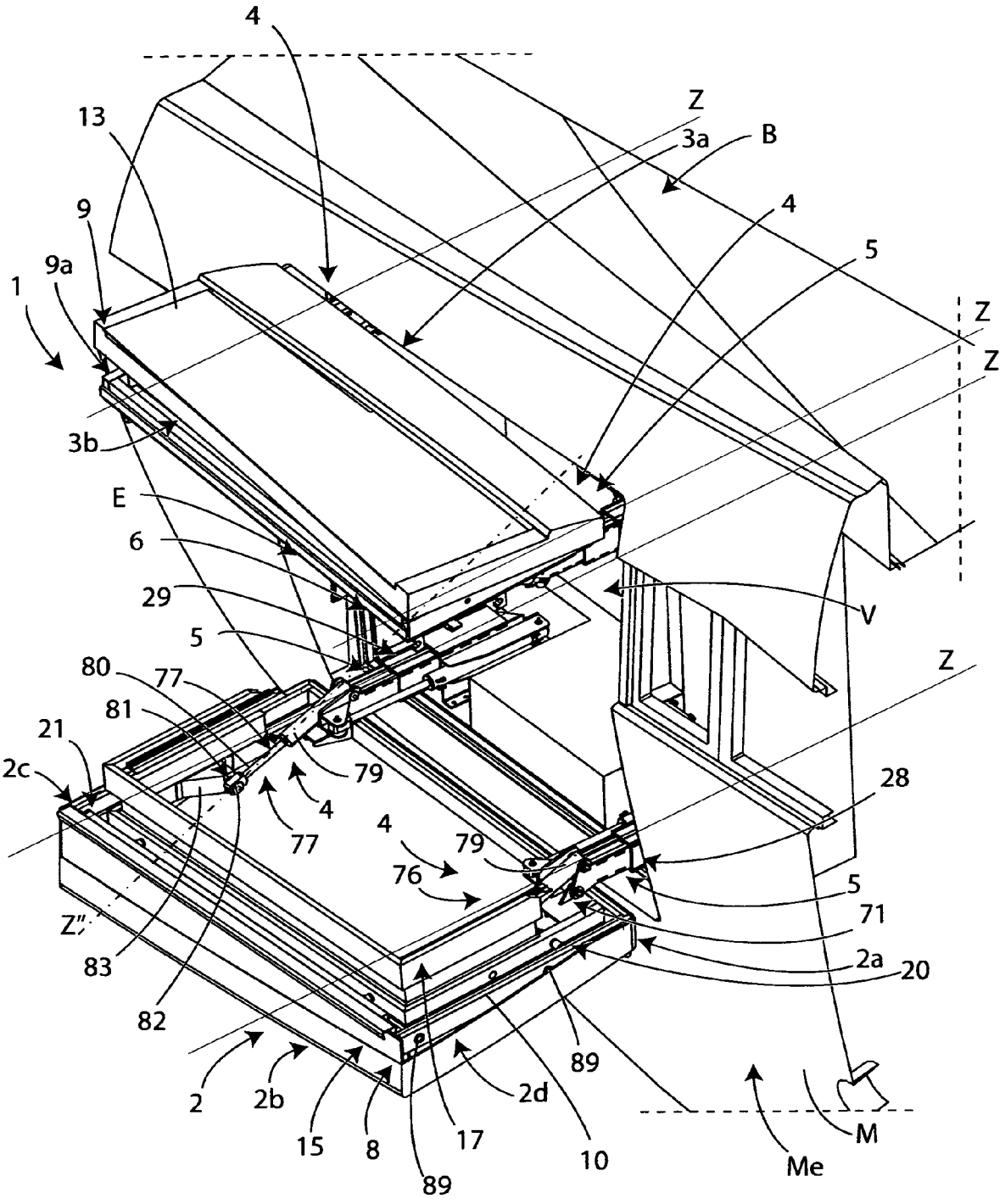


Fig. 1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77
81
21
2c
79
4
77
4
79
76
28
5
71
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2
2b
2d
15
8
17
10
89
Me
M

Fig. 2

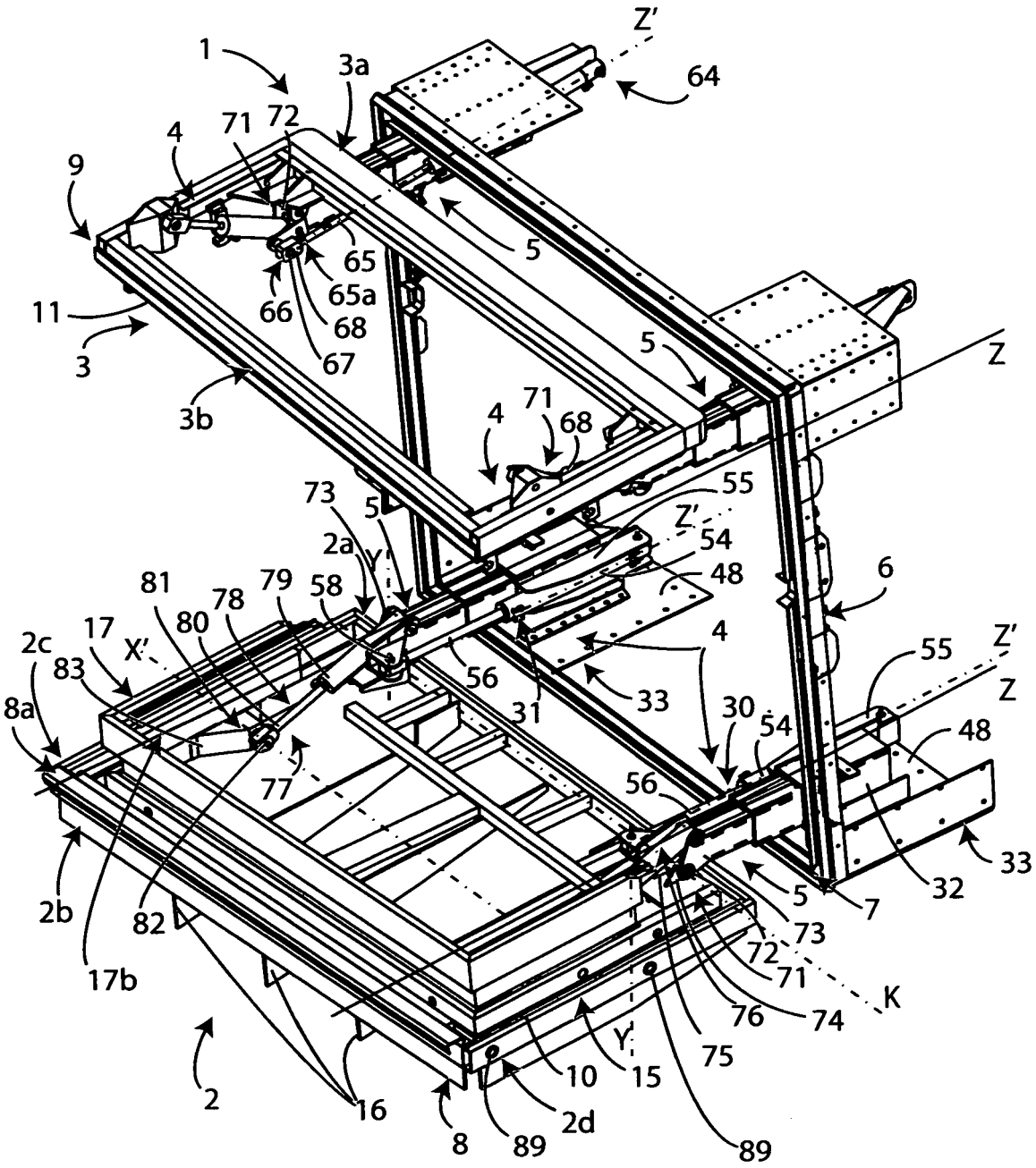
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Fig. 3

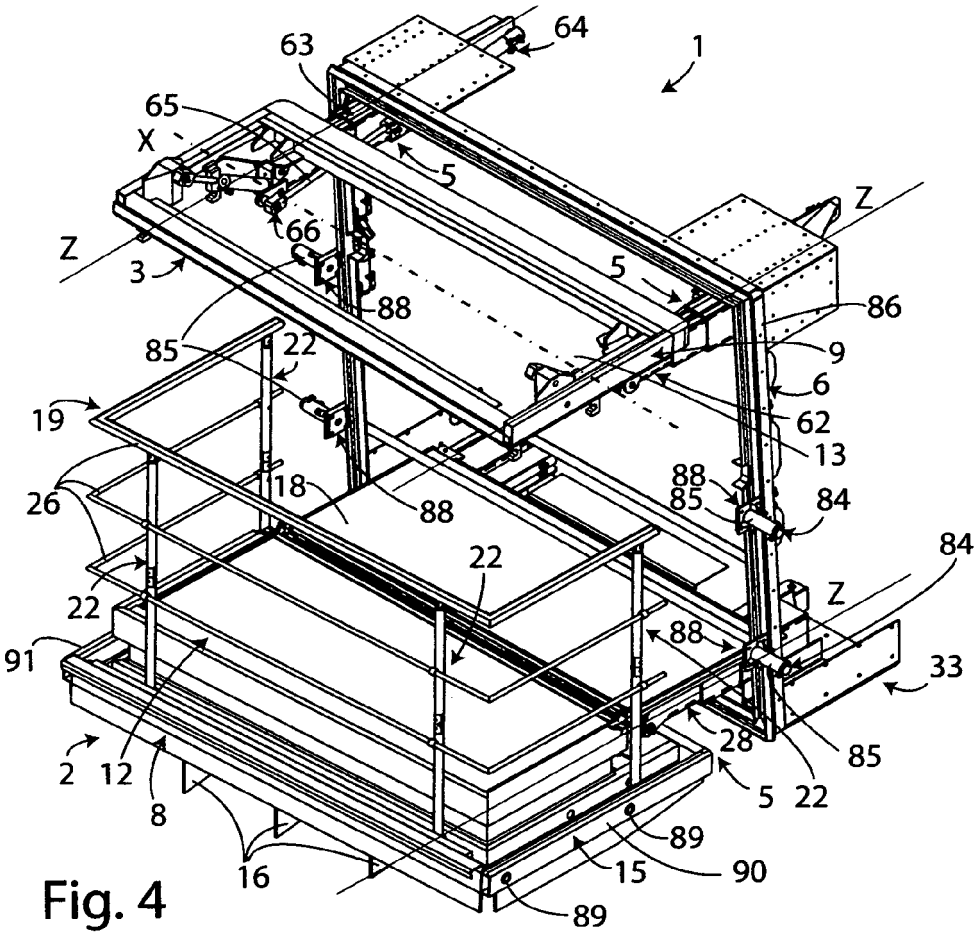
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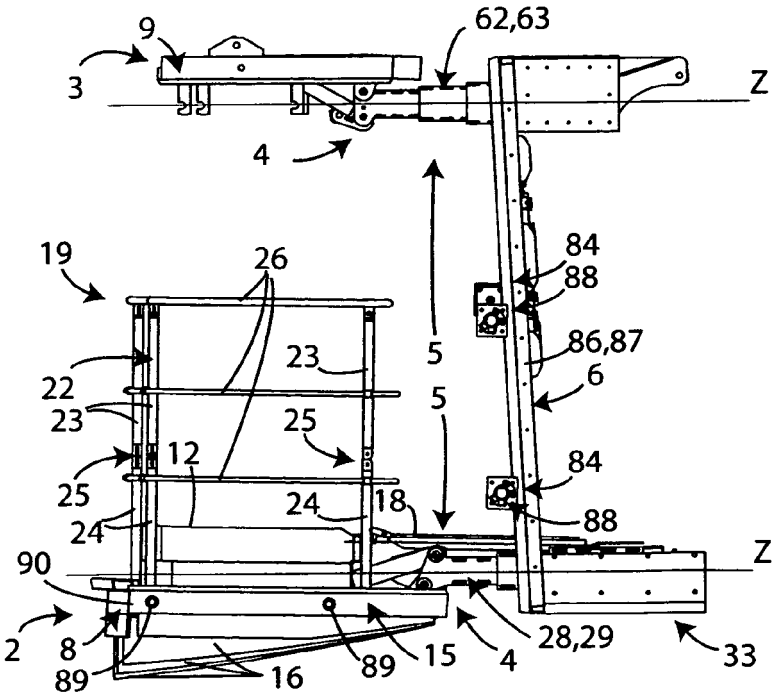
Fig. 4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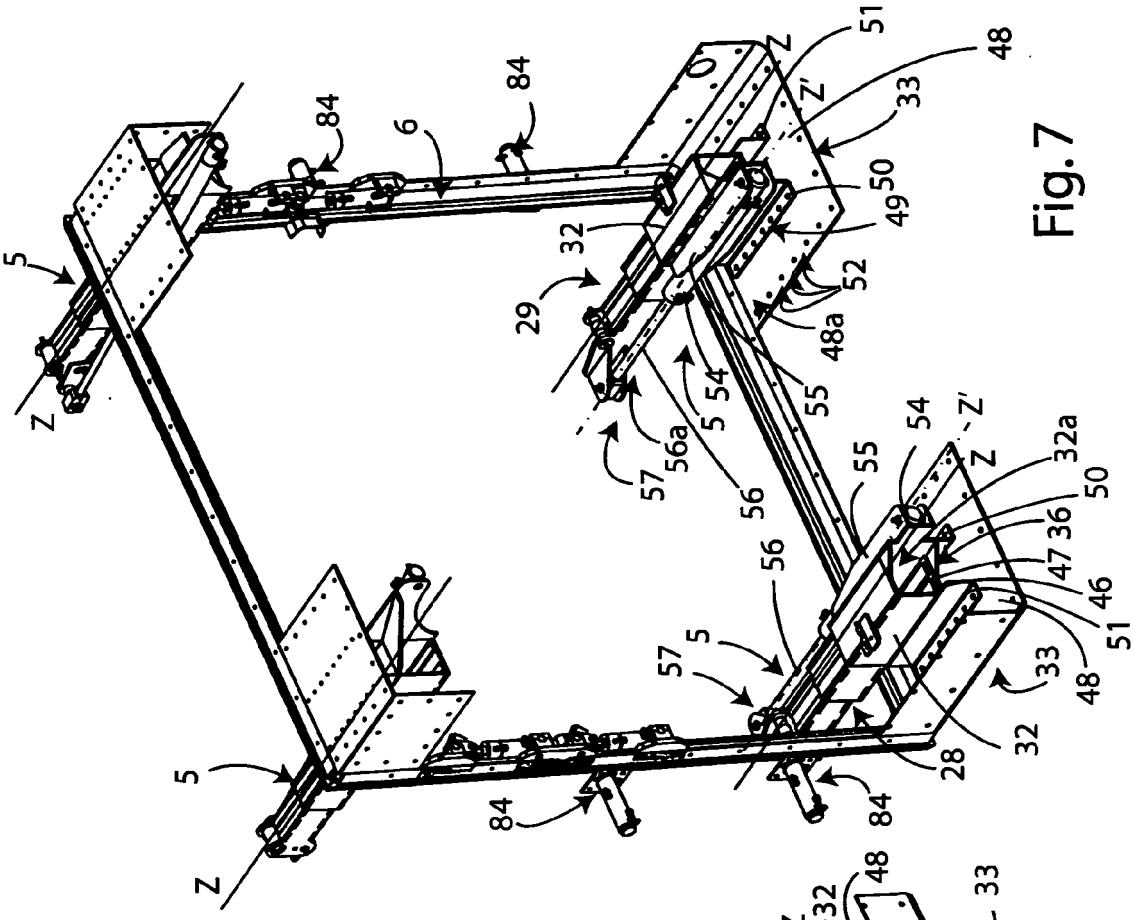
28,29
33

Fig. 5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32a
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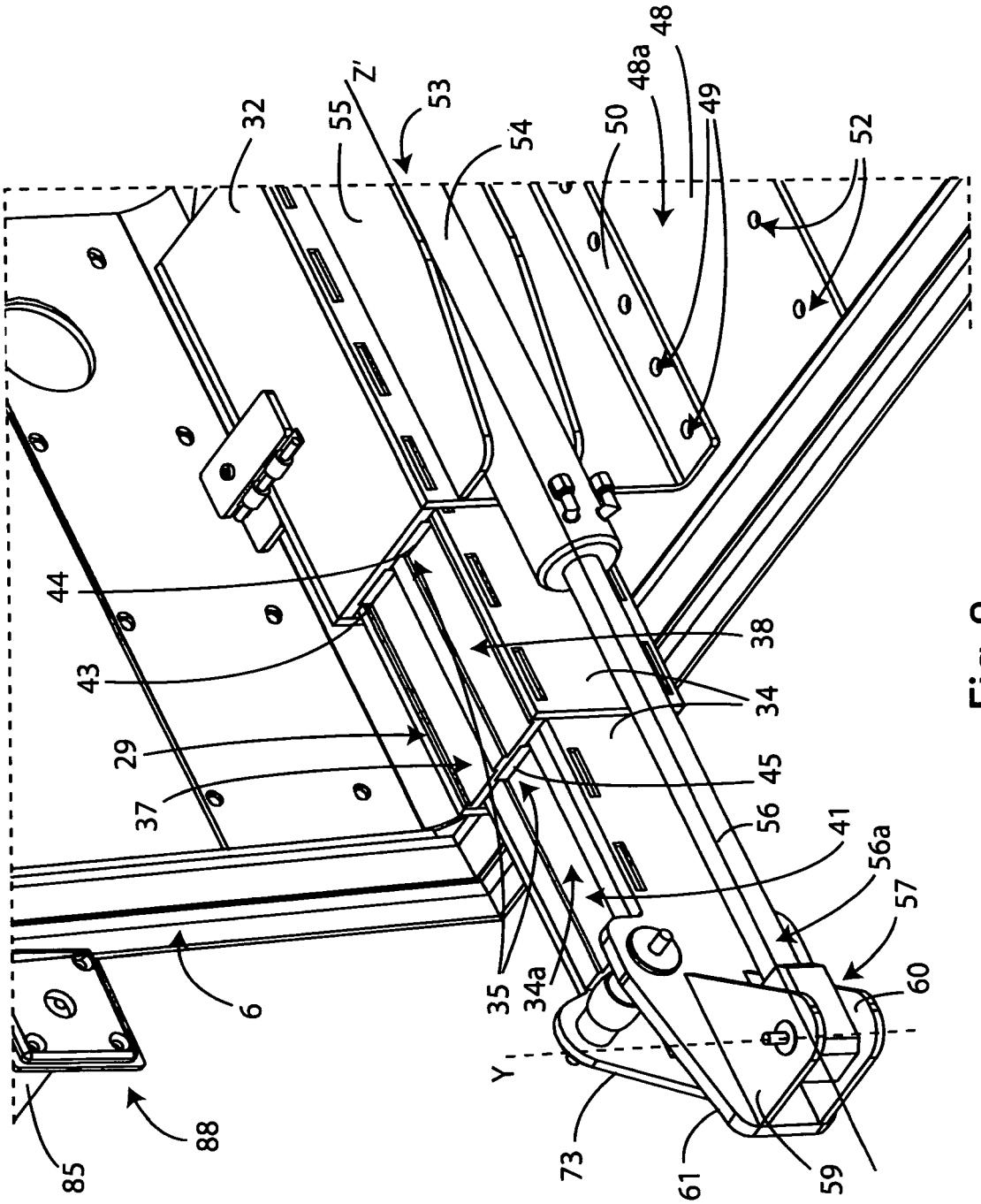
47

Fig. 7

Fig. 6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Z'
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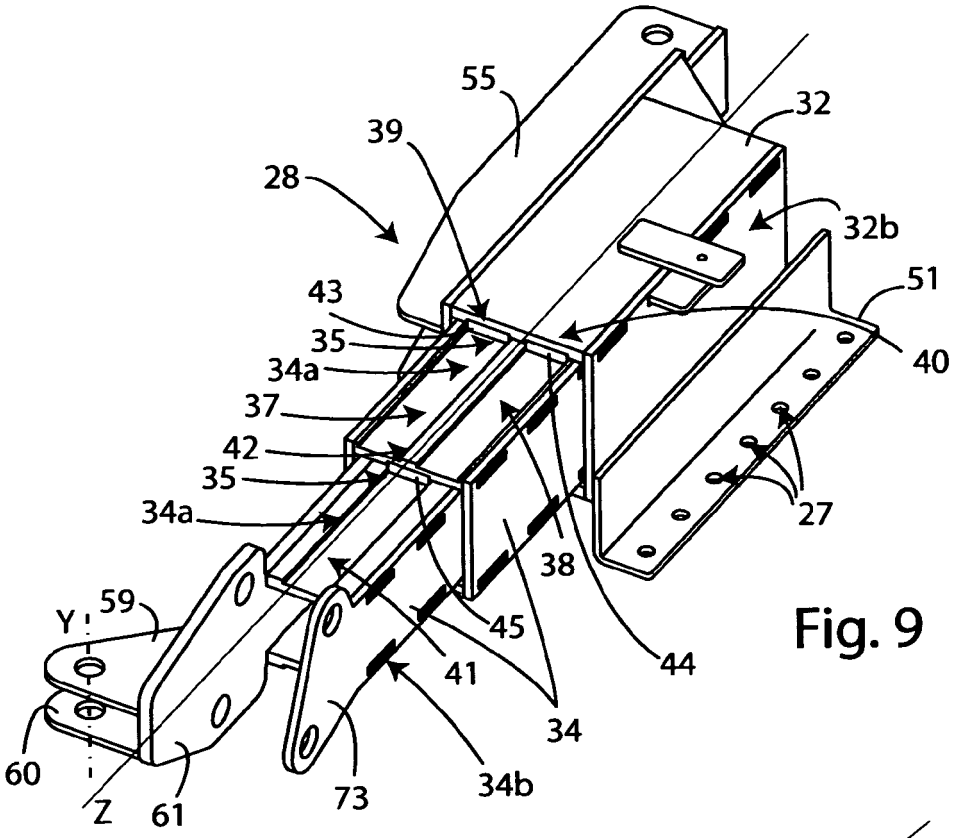
59

Fig. 8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Z
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73
34b

Fig. 9

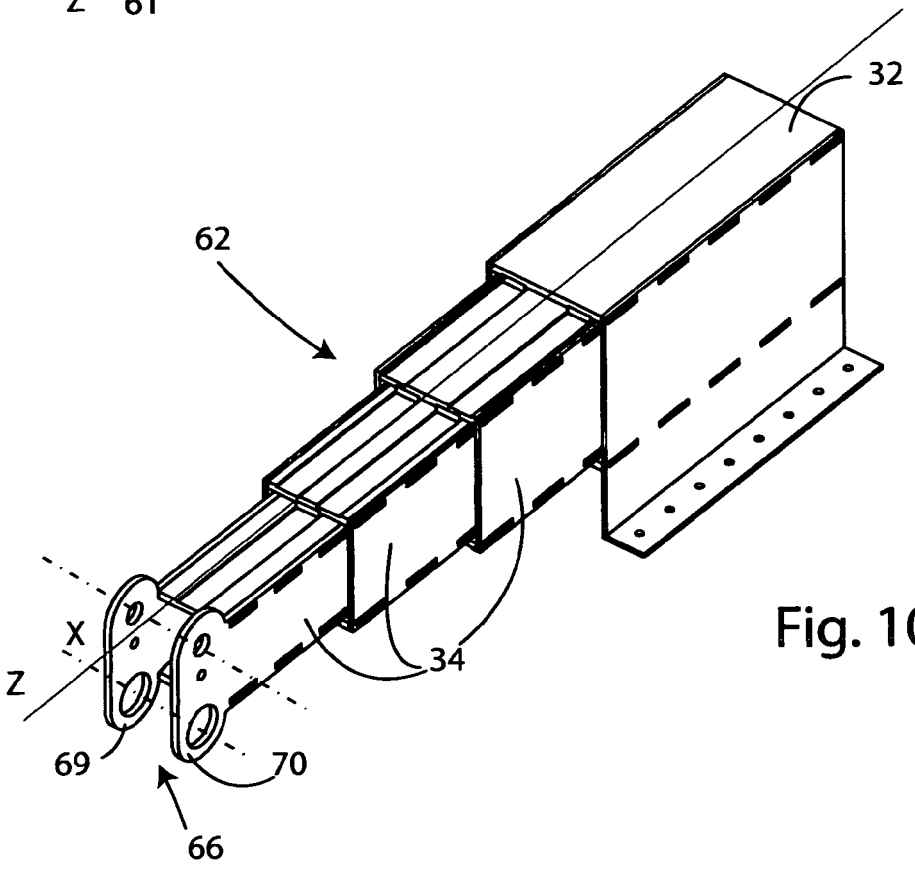
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Fig. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 10 42 5316

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	EP 1 122 164 A2 (HAMWORTHY KSE GMBH [DE]) 8 August 2001 (2001-08-08) * abstract * * paragraphs [0002], [0003], [0005], [0006], [0008], [0012], [0014] * * figures 1-8 *	1-3,10, 11,15-21 4-9	INV. B63B19/08 B63B27/14
Y	US 6 003 463 A (GIESLER GARY D [CA]) 21 December 1999 (1999-12-21) * abstract * * column 5, lines 44-50 * * figure 1 *	4-9	
Y	EP 1 616 782 A1 (MARDIKIAN FAMILY TRUST [US]) 18 January 2006 (2006-01-18) * the whole document *	4-9	
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B63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	14 February 2011	Weber, Ingo

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14-02-2011

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