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(71) Applicant: **Cabello Forns, Brenton**
17844 Pujals dels Pagesos (Girona) (ES)

(72) Inventor: **Cabello Forns, Brenton**
17844 Pujals dels Pagesos (Girona) (ES)

(74) Representative: **Araujo, Daniel**
Ingenias Creaciones
Signos e Invenciones S.L.
Avda Diagonal 514 Planta 1, Puerta 4
08006 Barcelona (ES)

(54) **POOL DIVIDER DEVICE**

(57) A pool divider device (1) for dividing at least one lane (20) of a swimming pool (2) into two shorter lanes (21, 22), comprising: a main structure (10) transversely arranged with respect to the at least one lane (20), configured to have a distance (H) from a water level (L) of the swimming pool (2) to allow a swimmer to pass below the main structure (10); and a lane divider device (11) connected to the main structure (10), comprising a dividing panel (110) and configured to move between an extended position (A), in which the dividing panel (110) is inserted into the lane (20) such that said lane (20) is divided into two shorter lanes (21, 22), and a retracted position (8), in which the dividing panel (110) is retracted towards the main structure (10) allowing a swimmer to pass below the main structure (10) and the panel (110).

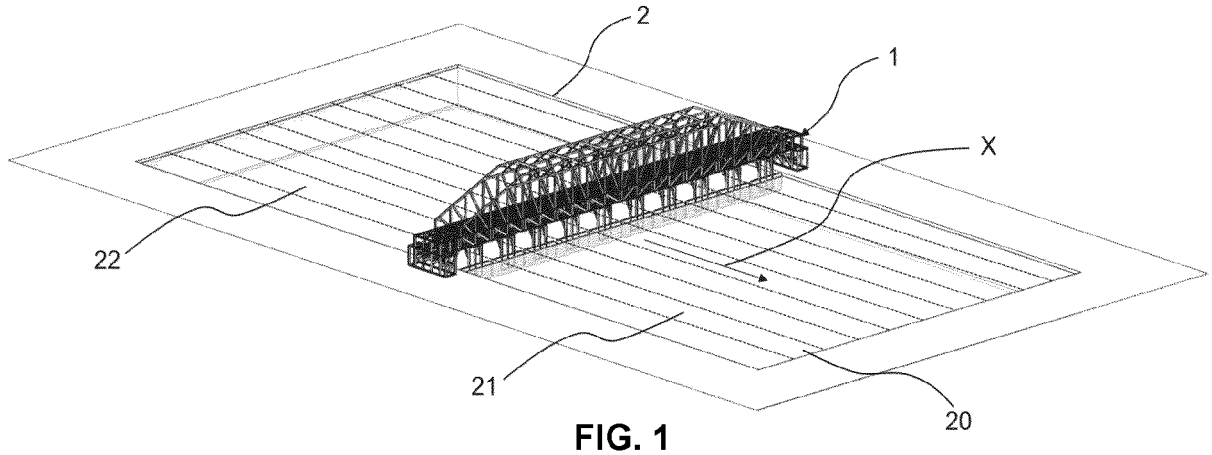

FIG. 1

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Description

TECHNICAL FIELD

[0001] The present invention relates to a pool divider device for selectively dividing at least one lane of a swimming pool into two respective shorter lanes. The pool divider device may be configured to be movable/displaceable along a longitudinal direction of the swimming pool.

PRIOR ART

[0002] Swimming pools are commonly used for sports and leisure activities. In order to make efficient use of the available space, it is common to divide the pool into lanes, allowing multiple swimmers to use the pool simultaneously. However, it is often necessary to adjust the length of the lanes to accommodate different types of training or events.

[0003] There are several prior art solutions for dividing lanes in a swimming pool. One approach is to use ropes (e.g. lane ropes) or floats that can be placed across the width of the pool to create lane dividers. However, these dividers can easily become tangled or dislodged, which can be hazardous for swimmers. Further, they do not allow the swimmers push against them when turning. Additionally, ropes and floats are often difficult to set up and adjust, which can be time-consuming and disruptive to pool users.

[0004] Another prior art solution involves installing permanent or hinged lane dividers in the pool. These dividers are typically made of plastic or metal and are anchored to the pool floor. While these dividers are more stable than ropes and floats, they are also more expensive to install and can be difficult to remove or adjust. Additionally, permanent dividers can limit the flexibility of the pool, making it less adaptable to different types of events or training needs. Further, this prior art solution requires work to be carried out on the bottom of the swimming pool to install hinges and hinged elements, these elements being potentially dangerous for the swimmers.

[0005] Other prior art solutions include the use of floating bulkheads transversely arranged with respect to a longitudinal direction of the swimming pool. However, known bulkheads are large structures that take up part of the length of the pool (normally, they take up between 50 cm and 1 metre) and do not allow individual selection of the lanes to be divided, but always act simultaneously on all lanes of the pool. In some cases, larger swimming pools are built for use with floating bulkheads. Further, bulkheads are very heavy structures that require a crane to install and remove them from swimming pools, e.g. for carrying out maintenance operations.

[0006] Therefore, there is a need for a device that can be easily installed and adjusted to create lane divisions/partitions in a swimming pool. Such a device should be easy to use, safe for swimmers, and cost-effective to install and maintain. The invention described in this patent application addresses these needs by providing a novel and inventive solution to the problem of selectively dividing lanes in a swimming pool.

SUMMARY OF THE INVENTION

[0007] The present invention addresses the problem of providing a solution for dividing at least one lane of a swimming pool into two shorter lanes to overcome the above-described disadvantages of the prior art solutions.

[0008] A first aspect of the invention refers to a pool divider device for selectively dividing at least one lane of a swimming pool into two respective shorter lanes, wherein the device comprises a main structure and at least one lane divider device movably connected to the main structure.

[0009] The main structure is configured to be transversely arranged with respect to the at least one lane to be divided into two respective shorter lanes, and is further configured (e.g. arranged) to have (i.e. to provide) a separation distance from a water level of the swimming pool.

[0010] The at least one lane divider device is connected to the main structure and comprises a dividing panel. The lane divider device is configured to be selectively movable between an extended position, in which the respective dividing panel is arranged perpendicularly inserted into a respective lane of the swimming pool such that said lane is divided into two shorter lanes, and a retracted position, in which the respective dividing panel is retracted (i.e. from the respective lane of the swimming pool) towards the main structure such that a swimmer is allowed to pass below the main structure and the dividing panel. A separation distance between the dividing panel and the water level is configured to allow a swimmer to pass below the main structure while swimming. This distance may be configured to be of at least 1000 mm, preferably at least 1100 mm and more preferably or at least 1300 or 1400 mm.

[0011] In some embodiments, the at least one lane divider device may be configured to be linearly displaceable (i.e. movable) between the extended and the retracted positions (e.g. by being linearly displaceable in a direction perpendicular to the water level, e.g. a vertical direction). In other embodiments, the lane divider device may be configured to be swivelling displaceable between the extend position and the retracted positions (e.g. by being hingedly/articulated connected to the main structure, such that the lane divider device moves angularly with respect to a hinged/articulated connection to the main structure).

[0012] In preferred embodiments of the invention, the main structure may be configured as a modular structure comprising a plurality of interconnectable modules (also referred to as main structure modules). Thus, the main structure may be configured as a plurality of main structure modules interconnected to each other, thereby forming the main structure. In a manner broadly compatible

with respect to the embodiments described in this specification, when the main structure comprises a plurality of main structure modules, each main structure module may comprise one or more lane divider devices according to the invention.

[0013] In preferred embodiments, and also in a manner broadly compatible with respect to the embodiments described in this specification, the main structure may be configured to be movable along a longitudinal direction extending along the at least one lane (i.e. along its length) to be divided in to two shorter lanes, such that, when the main structure is displaced along the longitudinal direction, then the length of the two respective shorter lanes relative to the length of the at least one lane to be divided is adjusted. Accordingly, the longitudinal direction refers to a direction along with the lane to be divided extends, which is normally aligned with a length of the swimming pool, wherein a swimming pool normally extends over a length and a transversal width, the length being normally longer than the width. Thus, the main structure may comprise one or more support means configured to allow a displacement of the main structure (and therefore of the lane divider device) along a direction aligned with the length of the lane to be divided, and may further comprise braking means configured to secure the support means in a particular position along the length of the lane to be divided (wherein the braking means are brakes/blockers/lockers for blocking the position of the support means). The one or more support means may be configured to be manually movable along the longitudinal direction or may comprise one or more means (e.g. automatic means of automated movement) configured for allowing an automatic movement of the support means (i.e. and thereby of the pool divider device) along the longitudinal direction. The support means may be configured as one or more base supports (e.g. lateral supports; e.g. at least one arranged at each side of the swimming pool) configured to be movable along a travel guide of the swimming pool, or as one or more base supports (e.g. at least one arranged at each side of the swimming pool) comprising wheels to be movable along a ground proximal to the swimming pool, or as a suspended structure (e.g. a hanging structure) configured to movable along the length of the at least one lane to be divided into two shorter lanes. Further, in some embodiments, the lane divider device may comprise a combination of the above-described types of support means, including one or more means for automated displacement.

[0014] The lane divider device (i.e. any of the at least one lane divider device) may comprise at least one actuator (i.e. a main actuator) configured to cause the lane divider device to move between the extended position and the retracted position. Preferably, the actuator (i.e. the main actuator) is configured as an automatic actuator, i.e. an actuator being configured to be remotely and/or automatically actuated. The at least one actuator may be arranged connected to the main structure and to the respective lane divider device. The at least one actuator may be configured as a mechanical actuator (or as an electro-mechanical actuator), preferably comprising a linear actuator and/or a motor. Further, the at least one actuator may be configured as a hydraulic actuator or a pneumatic actuator (e.g. a hydraulic or a pneumatic linear actuator). Details on possible arrangements for the at least one actuator are described below. The at least one actuator may be arranged connected to the main structure and to the lane divider device.

[0015] The lane divider device (i.e. any of the at least one lane divider device) may further comprise a respective support structure configured for connecting the dividing panel to the main structure. The support structure may be monolithic with the respective dividing panel (i.e. the support structure may be configured to be integral with the dividing panel, so that both elements are formed as a single body) or may be rigidly connected to the respective dividing panel (i.e. solidly connected such that the support structure and the dividing panel move together, e.g. between the extended position and the retracted position) and connected (e.g. movably connected) to the main structure such that the lane divider device is allowed to move (e.g. relative to the main structure) between its respective extended position and its respective retracted position. Preferably, said support structure may be further configured such that, when the lane divider device is arranged in its extended position, the dividing panel protrudes from the water level (i.e. from the surface of the water of the swimming pool) by a predetermined distance (e.g. between 10 and 500 mm, preferably between 100 and 400 mm, more preferably between 200 and 300 mm, such as 230, 240 or 250 mm). Further, the support structure may be configured to provide a separation space between the dividing panel and the main structure. Preferably, said separation space may be configured such that air is allowed to flow through said separation space (e.g. the support structure may comprise one or more air windows or openings) (i.e. the support structure may be configured to minimize the impact of airstreams on the stability of the dividing panel and/or of the pool divider device). The support structure may comprise (or may be made of) a metal (such as aluminium or stainless steel) and/or a non-metallic material, such as a plastic or other synthetic material (e.g. polymeric material, fiberglass, carbon fibre, polyester resin, epoxy resin or polyurethane resin, or a combination thereof).

[0016] The support structure of the lane divider device (i.e. of any of the at least one lane divider device) may comprise at least one elongated member extending from the respective dividing panel to the main structure (alternatively or complementarily, the support structure may comprise at least one structural element configured as a plate). An elongated member refers to a structural element (e.g. a bar or row) configured to extend mainly along a length (e.g. mainly longitudinally). In preferred embodiments, the support structure may comprise at least two or at least three elongated members spaced apart from each other such that one or more air windows are formed

between the elongated members (i.e. along the separation space between the dividing panel and the main structure). Thus, when the lane divider device is arranged in its extended position, the at least one air window is arranged between the dividing panel, the main structure and the at least two elongated members. More preferably, the support structure further comprises at least one interconnecting member transversely arranged with respect to the elongated members and configured to interconnect to each other at least two of the elongated members. The at least one interconnecting element may be configured to structurally reinforce the elongated members.

[0017] In some embodiments, the at least one actuator (i.e. the main actuator) configured to cause the lane divider device to move between the extended position and the retracted position may be arranged connected between the main structure and the lane divider device (e.g. connected to one of the elongated members and/or one of the interconnecting members).

[0018] The support structure of the lane divider device may further comprise an auxiliary structural portion extending from a part (e.g. an end portion) of the support structure distally arranged with respect to the dividing panel, wherein said auxiliary structural portion is configured to extend at least partially along a direction being perpendicular or oblique to a geometric plane (the geometric plane not being part of the invention, but an external geometric reference) arranged centrally with respect to a thickness of the dividing panel. Thus, the auxiliary structural portion may comprise a respective end portion arranged at an offset distance from said geometric plane. In preferred embodiments, the auxiliary structural portion may comprise (or may be configured as) at least two structural arms, wherein the end portion of the auxiliary structural portion may comprise (or may be configured as) respective end portions of the at least two structural arms arranged at an offset distance from said geometric plane.

[0019] The dividing panel (i.e. of any of the at least one lane divider) may be configured as a solid body, (i.e. a body having a thickness). Alternatively, the dividing panel may comprise two planar plates, wherein each planar plate may be arranged at a respective side of the support structure. Thus, when the lane divider device is arranged in its respective extended position, each planar plate is arranged facing a respective shorter lane. The dividing panel (i.e. the solid body or the planar plates) is configured as a rigid element, preferably configured to be lightweight. The dividing panel may be made of a metal (such as aluminium or stainless steel) or, preferably, of a plastic or other synthetic material (such as a polymeric material, fiberglass, carbon fibre, polyester resin, epoxy resin or polyurethane resin).

[0020] The lane divider device may further comprise one or more articulations (e.g. hinged connections) configured to movably connect the lane divider device to the main structure, such that the lane divider device is configured to swivel angularly between its respective extended position and its respective retracted position. Preferably, the one or more articulations of the lane divider device may be arranged at a part of the lane divider device being distally arranged with respect to the dividing panel. In preferred embodiments, the part of the lane divider device configured to be connected to the main structure by means of the one or more articulations is a part (e.g. a respective end portion) of the one or more elongated elements being distally arranged with respect to the dividing panel.

[0021] Therefore, in some embodiments, the one or more articulations of the lane divider device that are arranged at a part of the lane divider device being distally arranged with respect to the dividing panel may be arranged at a respective end portion of the at least one elongated member of the support structure, said respective end portion being distally arranged with respect to the dividing panel. Preferably, the support structure may comprise a plurality of elongated members, and the articulations may comprise at least two articulations, such that each articulation is arranged at a respective end portion of an elongated member. Preferably, said at least one elongated member may be configured such that, when the lane divider device is arranged in its extended position, the at least one elongated member is arranged vertically, i.e. being perpendicular to the respective lane of the swimming pool to be divided into two shorter lanes. Therefore, said at least one elongated member being configured to extend along a shortest straight path between the articulation (i.e. between the main structure) and the dividing panel.

[0022] Each of the at least one articulation of the lane divider device may comprise a respective spherical bearing configured to allow an oscillating adjustment between the lane divider device and the main structure. The spherical bearings help to absorb mounting tolerances of the pool divider device for ensuring a proper adjustment and movement of the lane divider device relative to the main structure. The spherical bearings have proved to be particularly advantageous when the lane divider device comprises two articulations arranged at a part of the lane divider device being distally arranged with respect to the dividing panel (e.g. arranged at respective end portions of two elongated member of the support structure).

[0023] The dividing panel of the lane divider device may be configured to extend transversely (i.e. in a direction being transverse to the dividing panel, which is also a direction being transverse to the at least one lane to be divided into two shorter lanes) between two respective opposing lateral portions of the dividing panel. Each lateral portion may comprise a respective lateral connector configured to be selectively actuated for providing a rigid connection to a respective lateral connector of a dividing panel of an adjacent lane divider device (wherein the adjacent lane divider is a lane divider device according to any embodiments of the invention). The lateral connector arranged at a lateral portion of a dividing panel

being adjacent (i.e. the lateral portion) to a wall of the swimming pool may be configured to provide a rigid connection to said wall and/or to the support means of the main structure. Preferably, each lateral connector may further comprise a respective auxiliar connector configured to be connected to a lane rope being external to the pool divider device. The auxiliar connector may be configured as a ring/eye-ring and/or may be arranged in in a position of the lateral connector being centrally arranged between the two adjacent dividing panels being connected.

[0024] In some embodiments, the dividing panel may comprise at least two lateral connectors arranged at each opposing lateral portion (e.g. at different heights of the dividing panel, such that one connector is arranged above the water level of the swimming pool and one connector is arranged below the water level of the swimming pool). The lateral connectors improve the stability of the dividing panels when the lane divider device is arranged in its extended position.

[0025] Each lateral connector may comprise a respective male and/or a respective female connector. The male connector (e.g. a deployable or articulated bar/rod) may be configured to be selectively activatable to connect with a female connector of an adjacent dividing panel.. The lateral connectors may further comprise a respective actuator configured to automatically activate (e.g. connect and/or lock) de lateral connector.

[0026] The dividing panel of the lane divider device may further comprise at least one (or at least two) transversal structural elements rigidly connected to the dividing panel and arranged transversely with respect to the dividing panel, preferably extending over a whole transverse extension of the dividing panel (i.e. between the two opposing lateral portions of the dividing panel). Each transversal structural element may be configured to be an integral part of the support structure (i.e. the support structure may comprise said at least one transversal structural element) or may be rigidly connectable to the support structure.

[0027] In preferred embodiments, the dividing panel of the lane divider device may be configured such that the at least one transversal structural element extends transversely between the two opposing lateral portions, wherein the lateral connectors are arranged/connected to respective ends of the transversal structural element.

[0028] In some embodiments, the pool divider device according to any of the preceding embodiments may further comprise one or more locking means configured to lock (e.g. to block or rigidly engage, i.e. to secure its position) the lane divider device to the main structure in its respective extended position and/or in its respective retracted position.

[0029] The one or more locking means may comprise: an extended position locker (i.e. a locker configured to lock the lane divider device in its extended position) and/or a retracted position blocker (i.e. a locker configured to lock the lane divider device in its retracted position).

[0030] The features described below for the extended position locker and the retracted position locker are broadly compatible with a plurality of configurations of the support structure.

[0031] The extended position locker may be configured to selectively lock (i.e. and unlock) the end portion of the auxiliary structural portion of the support structure of the lane divider device (e.g. the respective end portions of the at least two structural arms of the support structure) to the main structure when the lane divider device is its extended position. Preferably, the extended position locker may further comprise at least one respective actuator configured to automatically lock the extended position locker. The at least one actuator may be configured as a mechanical and/or as an electro-mechanical actuator, wherein the at least one actuator is preferably configured as a linear actuator or as a solenoid actuator. The extended position locker may further comprise (or being configured as) one or more locking connectors such as one or more clamps (e.g. mechanical clamps) configured to be controlled/activated by means the at least one respective actuator. It is noted that in some embodiments the locking connectors may be configured as electro-mechanical clamps such that the respective actuator may be an integral part of the clamp. In those embodiments in which there is a plurality (e.g. two) of locking connectors (e.g. clamps), the plurality of clamps may be connected to each other by means of at least one auxiliary connecting element (e.g. by at least one respective connecting rod or bar) such that a single actuator may be activated to actuate (i.e. to lock/unlock) all the clamps simultaneously. Further, the auxiliary connecting element has the technical effect of providing a structural support for increasing the rigidity of the lane divider device when arranged in its extended position, while not increasing a mass of the lane divider device that has to be moved between the extended and the retracted positions. This is because the auxiliary connecting element is connected to the respective actuator of the extended position locker which is, in turn, connected to the main structure, so that the auxiliary connecting element is not displaced together with the support structure of the lane divider device.

[0032] The retracted position locker may be configured to selectively lock (i.e. and unlock) the end portion of the auxiliary structural portion of the support structure of the lane divider device (e.g. the respective end portions of the at least two structural arms of the auxiliary structural portion) to the main structure when the lane divider device is its retracted position. Preferably, the retracted position locker may further comprise at least one respective actuator configured to automatically lock the retracted position locker. The at least one actuator of the retracted position locker may be configured as a mechanical or as an electro-mechanical actuator, wherein the actuator of the retracted position locker may be preferably configured as a linear actuator or as a solenoid actuator. Pref-

erably, the extended position locker may be configured as one or more solenoid actuators movable between a locking position and an unlocking position.

[0033] In preferred embodiments of the invention, the extended position locker may be configured as a plurality of mechanical clamps connected to each other by means of at least one connecting bar, wherein said at least one bar may be actuated by a single linear actuator to selectively lock and unlock the locker. In the same preferred embodiment, the optional retracted position locker may be configured as one or more solenoid actuators.

[0034] According to some embodiments of the invention, the pool divider device may comprise a main structure and a plurality of lane divider devices, wherein each of these lane divider devices may comprise any combination of features (i.e. features related to the lane divider devices) previously described for the lane divider devices.

[0035] In those embodiments comprising a main structure and a plurality of lane divider devices, the main structure may preferably be configured as a plurality of main structure modules interconnected to each other. In other words, the main structure may comprise a plurality of main structure modules configured to be connected to each other to form the main structure. In more preferred embodiments, each main structure module may be configured to comprise one or more lane divider devices of the plurality of lane divider devices. Further, said main structure may comprise one or more support means (as previously described) configured as static supports or as supports configured to allow a displacement of the main structure (and therefore of the lane divider device) along a direction aligned with the length of the lane to be divided. Additionally, the main one or more support means may further comprise braking means configured to secure the support means in a particular position along the length of the lane to be divided.

[0036] According to some preferred embodiments, the main structure of any of the pool divider devices previously described may be configured as a bridge structure having a walkable surface for allowing a person/pedestrian to walk over the main structure.

[0037] The main structure and the one or more lane divider devices may be configured to provide the pool divider device with a rigid structure. In particular, the main structure and the one or more lane divider devices may be configured such that, when one or more swimmers push against one or more of the dividing panels (i.e. the respective lane divider devices 11 being arranged in its extended position "A") when turning a swimming direction (i.e. when reversing the swimming direction), the main structure and the one or more lane divider devices provide sufficient rigidity such that the dividing panels remain at its extended position without being subject to any displacement (or being subject to a displacement being within a predetermined tolerance, such as less than 5 cm, preferably less than 2.5 cm, more preferably less than 1 cm). For this purpose, the main structure may be configured as a tubular structure, e.g. comprising a plurality of triangle structures made of tubes. Further, the extended position of the lane divider device(s) (and therefore of the lane dividing panel(s)) may be additionally reinforced with the one or more locking means according to the description previously provided, in particular with the help of the extended position locker.

BRIEF DESCRIPTION OF THE DRAWINGS

[0038] Preferred embodiments of the invention are described below with reference to the attached drawings, in which:

Fig. 1 depicts a view of a pool divider device 1 according to embodiments of the invention transversely arranged with respect to a swimming pool 2.

Fig. 2 shows an enlarged view of the pool divider device 1 of Fig. 1.

Figs. 3A and 3B show a detailed view of a portion of a pool divider device 1 according to embodiments of the invention, wherein Fig. 3A depicts a lane divider device 11 in its extended position "A" and Fig. 3B shows the lane divider device 11 in its retracted position "B".

Fig. 4 represents a lane divider device 11 of a pool divider device 1 according to embodiments of the invention.

Fig. 5 shows a front view of a pool divider device 1 according to the invention installed in a swimming pool 2.

Figs. 6A-6E depict respective detailed views of a pool divider device 1 in which the lane divider device 11 is arranged in its extended position "A".

Figs. 7A and 7B show respective detailed views of the pool divider device 1 of Figs. 6A-6E in which the lane divider device 11 is arranged in its retracted position "B".

Fig. 8 shows the pool divider device 1 of Figs. 6A-6E and 7A-7B in which the lane divider device 11 is an intermediate position between the extended "A" and the retracted "B" positions.

DETAILED DESCRIPTION OF THE DRAWINGS

[0039] Fig. 1 depicts a view of a pool divider device 1 according to the invention, wherein the pool divider device 1 is transversely arranged with respect to a swimming pool 2. The pool divider device 1 is configured for selectively dividing at least one lane 20 of the swimming pool 2 into two respective shorter lanes 21, 22. In partic-

ular, the pool divider device 1 shown in Fig. 1 is configured to divide all the lanes of the swimming pool 2 into two respective shorter lanes. In Fig. 1, a longitudinal direction "X" of the lane 20 to be divided is identified, wherein this longitudinal direction in this case is coincident with a longitudinal direction of the swimming pool 2. In the context of the present invention, a transverse or transversal direction refers to a direction being perpendicular to the longitudinal direction "X", such that said transverse or transversal direction is perpendicular to the lanes of the swimming pool 2 (i.e. the transverse or transversal direction is arranged perpendicular to the at least one lane to be divided but it is also arranged substantially coplanar with respect to a water surface of the swimming pool 2 when the water is at complete rest).

[0040] Fig. 2 shows an enlarged view of the pool divider device 1 of Fig. 1. The pool divider device 1 of Fig. 2 comprises a main structure 10 and a plurality of lane divider devices 11 (it should be noted that in other compatible embodiments the pool divider device may comprise at least one lane divider device 11 according to any of the configurations described) movably connected to the main structure 10.

[0041] The main structure 10 is further configured to have (i.e. to provide) a separation distance H (e.g. a height distance) from a water level L of the swimming pool 2 (see Fig. 5 which depicts the configuration of said separation distance and the water level).

[0042] Although not visible in Figs. 1 and 2, the main structure 10 of Figs. 1 and 2 may be configured as a modular structure comprising a plurality of interconnectable modules (main structure modules 101, c.f. Figs. 3A and 3B, which show a more detailed embodiments of a lane divider device 11 compatible with Figs. 1 and 2). Thus, the main structure 10 may be configured as a plurality of main structure modules 101 interconnected to each other, thereby forming the main structure 10, wherein each of the main structure modules 101 may comprise one or more lane divider devices 11 according to the invention. However, in other embodiments of the invention compatible with the images depicted in Figs. 1 and 2, the main structure 10 may be formed as a single-body structure (i.e. the main structure 10 comprising a single module 101 or the main structure 10 not being a modular structure).

[0043] The at least one lane divider device 11 is connected to the main structure 10 and comprises a dividing panel 110 (see Fig. 3A). The lane divider device 11 is configured to be selectively movable between an extended position "A" (see Fig. 3A), in which the respective dividing panel 110 is arranged perpendicularly inserted into a respective lane 20 of the swimming pool 2 such that said lane 20 is divided into two shorter lanes 21-22, and a retracted position "B" (see Fig. 3B), in which the respective dividing panel 110 is retracted (i.e. from the respective lane 20 of the swimming pool 2) towards the main structure 10 such that a swimmer is allowed to pass below the main structure and the dividing panel. A separation distance between the dividing panel 110 and the water level L is configured to allow a swimmer to pass below the main structure 10 while swimming. This distance may be configured to be of at least 1000 mm, preferably at least 1100 mm and more preferably or at least 1300 or 1400 mm.

[0044] The main structure 10 of the pool divider device 1 shown in Figs. 1 and 2 (although not visible) may be configured to be displaceable/movable along the longitudinal direction "X". Thus, when the main structure 10 is displaced along the longitudinal direction "X", then a respective length of the two respective shorter lanes 21-22 relative to the length of the at least one lane 20 to be divided is adjusted (i.e. the sum of the lengths of both shorter lanes 20 and 21 is always the length of the original lane 20, but the percentage of the length of the original lane 20 given to each shorter lane 20-21 may be adjusted).

[0045] The main structure 10 of Figs. 1 and 2 comprises two respective support means 30 (e.g. also referred to as lateral supports 30 or base supports 30) for supporting a weight of the pool divider device 1 on a floor adjacent to the swimming pool 2. Although, the support means 30 shown in Figs. 1 and 2 are schematically represented so that they seem to be configured as static supports, said supports 30 may be configured as static support, but alternatively and preferably may be configured as supports 30 configured to allow the displacement of the main structure 10 (and therefore of the lane divider devices 11 and the pool divider device 1 itself) along the longitudinal direction "X", as previously described. Thus, the support means 30 may be configured as one or more base supports (e.g. lateral supports; e.g. at least one arranged at each side of the swimming pool 2) configured to be movable along a travel guide of the swimming pool 2, or as one or more base supports 30 (e.g. at least one arranged at each side of the swimming pool) comprising wheels to be movable along a ground/floor proximal to the swimming pool 2. In some embodiments, the support means 30 may comprise braking means configured to secure the support means 30 in a particular position along the longitudinal direction "X". In alternative embodiments, the main structure 10 may be configured as a suspended structure (e.g. a hanging structure) configured to movable along the longitudinal direction "X".

[0046] The one or more support means 30 may be configured to be manually movable along the longitudinal direction "X" or may comprise one or more means (e.g. automatic means of automated movement) configured for allowing an automatic movement of the support means 30 (i.e. and thereby of the pool divider device 1) along the longitudinal direction "X".

[0047] Although not visible in Figs. 1 and 2, the at least one lane divider device 11 is configured to be swivelling displaceable between the extend position "A" and the retracted "B" positions (e.g. by being hingedly/articulated connected to the main structure 10, such that the lane divider device(s) 11 moves angularly with respect to a

hinged/articulated connection to the main structure 10). However, in other embodiments compatible with Figs. 1 and 2 the lane divider device(s) may be configured to be linearly displaceable between the extended "A" and the retracted "B" positions (e.g. by being linearly displaceable in a direction perpendicular to the surface of water of the swimming pool 2, e.g. a vertical direction).

[0048] Figs. 1 and 2 show an optional configuration of the pool divider device 1 in which the main structure 10 is configured as a bridge structure having a walkable surface for allowing a person/pedestrian to walk over the main structure 10.

[0049] The main structure 10 and the one or more lane divider devices 11 are configured to provide the pool divider device 1 with a rigid structure. In particular, the main structure 10 and the one or more lane divider devices 11 may be configured such that, when one or more swimmers push against one or more of the dividing panels 110 (i.e. the respective lane divider devices 11 being arranged in its extended position "A") when turning a swimming direction, the main structure 10 and the one or more lane divider devices 11 provide sufficient rigidity such that the dividing panels 101 remain at its extended position "A" without being subject to any displacement (or being subject to a displacement being within a predetermined tolerance, such as less than 5 cm, preferably less than 2.5 cm, more preferably less than 1 cm). For this purpose, the main structure 10 may be configured as a tubular structure, e.g. comprising a plurality of triangle structures made of tubes. Further, for reinforcing the stability of the extended position "A" of the lane divider device (and therefore of the lane dividing panel 110) one or more locking means may be provided as described below.

[0050] Figs. 3A and 3B show a detailed view of a portion of a pool divider device 1 compatible with the embodiments shown in Figs. 1 and 2. Fig. 3A depicts a lane divider device 11 (within the dotted line) arranged in its extended position "A" and Fig. 3B shows the same lane divider device 11 arranged in its retracted position "B". The portion of the main structure 10 visible in Figs. 3A and 3B is identified as a respective main structure module 101 connected therein to a respective lane divider device 11. However, it should be noted that this same portion of the main structure 10 referred to with reference sign 101 may also represent (or be interpreted as) a portion of a bigger main structure 10 (i.e. a main structure 10 configured as a single-body structure, i.e. not being a modular structure).

[0051] The lane divider device 11 of Fig. 3A comprises an actuator 111 (also referred to as main actuator 111) (although a higher number of actuators may be provided) configured to cause the lane divider device 11 to move between the extended position "A" and the retracted position "B". Preferably, the actuator 111 is configured as an automatic actuator 111. The actuator 111 may be configured as a mechanical actuator or as an electro-mechanical actuator. Fig. 3A shows an actuator comprising (or being configured as) a linear actuator. However, in other embodiments the actuator 111 may comprise a linear actuator and/or a motor. Further, the linear actuator 111 may be configured as an electro-mechanical actuator or as a hydraulic actuator or a pneumatic actuator. The actuator 111 may be further configured to block/retain the lane divider device 11 in its extended "A" and/or in its retracted "B" positions. Details on possible arrangements for the at least one actuator 111 are described below for Figs. 6A, 6B, 6D and 7A. The actuator 111 is arranged connected to the main structure 10 and to the lane divider device 11.

[0052] The lane divider device 11 of Figs. 3A and 3B is configured to be swivelling displaceable between the extend position "A" and the retracted "B" positions (e.g. by being hingedly/articulated connected to the main structure 10, such that the lane divider device 11 moves angularly with respect to a hinged/articulated connection to the main structure 10). However, in other compatible embodiments the lane divider device(s) may be configured to be linearly displaceable between the extended "A" and the retracted "B" positions (e.g. by being linearly displaceable in a direction perpendicular to the surface of water of the swimming pool 2, e.g. a vertical direction).

[0053] Fig. 4 represents the lane divider device 11 of Figs. 3A and 3B. The lane divider device 11 comprises a respective support structure 113 configured for connecting the dividing panel 110 to the main structure 10. The support structure 113 is rigidly connected to the respective dividing panel 110 (i.e. solidly connected such that the support structure 113 and the dividing panel 110 move together, e.g. between the extended position "A" and the retracted position "B") and connected (e.g. movable connected) to the main structure 10 (not visible in Fig. 4) such that the lane divider device 11 is allowed to move (e.g. relative to the main structure 10) between its respective extended position "A" and its respective retracted position "B".

[0054] Preferably, as represented in Fig. 5 for a similar embodiment, the support structure 113 of Fig. 4 may be further configured such that, when the lane divider device 11 is arranged in its extended position "A", the dividing panel protrudes from the water level L by a predetermined distance (e.g. between 10 and 500 mm, preferably between 100 and 400 mm, more preferably between 200 and 300 mm, such as 230, 240 or 250 mm).

[0055] Further, the support structure 113 shown in Fig. 4 is configured to provide a separation space between the dividing panel 110 and the main structure 10 (the main structure not being visible in Fig. 4) The support structure 113 may comprise (or may be made of) a metal (such as aluminium or stainless steel) and/or a non-metallic material, such as a plastic or other synthetic material (e.g. polymeric material, fiberglass, carbon fibre, polyester resin, epoxy resin or polyurethane resin, or a combination thereof)..

[0056] The support structure 113 of Fig. 4 comprises a plurality of elongated members 114 (in particular three)

extending (preferably vertically) from the respective dividing panel 110 towards the main structure. An elongated member refers to a structural element (e.g. a bar or row) configured to extend mainly along a length (e.g. mainly longitudinally). In other compatible embodiments the number of elongated members 114 may be different: one, two, three, four or more. The elongated members 114 depicted in Fig. 4 are spaced apart from each other such that respective air windows 115 are formed between the elongated members 114 (i.e. across the separation space between the dividing panel 110 and the main structure 11). Thus, when the lane divider device 11 is arranged in its extended position "A", the air windows 115 are arranged between the dividing panel 110, the main structure 10 and the elongated members 114.

[0057] The support structure 113 of Fig. 4 further comprises optional interconnecting members 117 transversely arranged with respect to the elongated members 114 and configured to interconnect at least two of the elongated members 114 to each other. One of the interconnecting members 117 is configured (optional feature) to attach the previously described actuator 111 (as seen in Fig. 3A). In other embodiments, the actuator 117 may be connected to another part of the support structure 113, such as to an elongated member 114.

[0058] The support structure 113 of the lane divider device 11 of Fig. 4 further comprise an auxiliary structural portion 122 (also referred to as auxiliar structure 122) extending from a part (e.g. an end portion 1141) of the support structure 113 distally arranged with respect to the dividing panel 110, wherein said auxiliary structural portion 122 is configured to extend along a direction being perpendicular (although in other embodiments may alternatively be configured to extend along a direction being oblique) to a geometric plane (not shown; the geometric plane not being part of the invention, but an external geometric reference) arranged centrally with respect to a thickness of the dividing panel 110. The auxiliary structural portion 122 depicted in Fig. 4 is a particular embodiment comprising a respective end portion 123 arranged at an offset distance from said geometric plane. Further, the auxiliary structural portion 122 of Fig. 4 comprises, as an optional feature, two structural arms 122 (wherein in other compatible embodiments the auxiliary structural portion 122 may comprise at least one or at least two structural arms 122). The structural arms 122 are arranged spaced apart to each other, preferably extending from the elongated members 114 of the support structure 113. Further, the end portion 123 of the auxiliary structural portion is configured as the respective end portions 123 of the two structural arms, said respective end portions 123 being arranged at an offset distance from said geometric plane.

[0059] In the embodiment shown in Fig. 4, the two structural arms 122 are configured to extend perpendicularly to the geometric plane of the dividing panel 110, such that these arms are configured as respective lever arms with respect to the dividing panel 110 suitable for providing a torque for locking the dividing panel 11 in its extended position "A". Thus, in some embodiments, as in the one depicted in Fig. 4, the end portion 123 of the auxiliary structural portion 122 may comprise a support or bracket 1231 configured to be selectively locked by a locking means (as the one shown in Figs. 6A, 6B and 7A under reference signs 1241 and 1242).

[0060] Additionally, the support structure 113 of Fig. 4 further comprises a respective reinforcing element (configured as a bar in Fig. 4 arranged in an inclined position) connecting each of the structural arms 122 of the auxiliary structural portion 122 to a respective part of one of the elongated members 114.

[0061] The dividing panel 110 of the lane divider 11 of Fig. 4 comprises two planar plates 1101, wherein each planar plate 1101 is arranged at a respective side (e.g. at each side of the previously described geometric plane) of the support structure 113. Thus, when the lane divider device 11 is arranged in its respective extended position A, each planar plate 1101 is arranged facing a respective shorter lane 21, 22. In alternative embodiments, the dividing panel 110 may be configured as a solid body (i.e. a body having a thickness).

[0062] The dividing panel 110 (i.e. configured as a solid body or as the planar plates 1101) is configured as a rigid element. The dividing panel may be made of a metal (such as aluminium or stainless steel) or, preferably, of a plastic or other synthetic material (such as a polymeric material, fiberglass, carbon fibre, polyester resin, epoxy resin or polyurethane resin).

[0063] The lane divider device 11 of Fig. 4 further comprises two articulations 116 (e.g. hinged connections; it should be noted that in other embodiments the number of articulations 116 may be one or more) configured to movably connect the lane divider device 11 to the main structure 10 (the main structure 10 not being shown in Fig. 4), such that the lane divider device 11 is configured to swivel angularly between its respective extended position "A" and its respective retracted position "B".

[0064] The articulations 116 of the lane divider 11 device are (optionally and preferably) arranged at a part of the lane divider device 11 being distally arranged with respect to the dividing panel 11. In the preferred embodiment shown in Fig. 4, the part of the lane divider device 11 configured to be connected to the main structure 10 by means of the articulations 116 is a part of the respective elongated elements 114 (of the support structure 113) being distally arranged with respect to the dividing panel 110.

[0065] In Fig. 4, the articulations 116 of the lane divider device 11 that are arranged at a part of the lane divider device 11 being distally arranged with respect to the dividing panel 110 may be arranged at a respective end portion 1141 of the at least one elongated member 114 of the support structure 113, said respective end portion 1141 being distally arranged with respect to the dividing panel 110. In other compatible embodiments, the support structure 113 may comprise a plurality of elongated mem-

bers 114, and the articulations 116 may comprise at least two articulations 116, such that each articulation 116 is arranged at a respective end portion 1141 of an elongated member 114.

[0066] The configuration shown in Fig. 4 represents the optional and preferred embodiment in which the elongated members 114 are configured such that, when the lane divider device 11 is arranged in its extended position "A", the elongated members 114 are arranged vertically, i.e. being perpendicular to the respective lane 20 of the swimming pool to be divided into two shorter lanes 21, 22 (c.f. Fig. 1).

[0067] The dividing panel 110 of the lane divider device 11 shown in Fig. 4 is configured to extend transversely (i.e. in a direction being transverse to the dividing panel 110, which is also a direction being transverse to the at least one lane 20 to be divided into two shorter lanes 21, 22) between two opposing lateral portions 119, 120. Each lateral portion 119, 120 of Fig. 4 comprises a respective (optional) lateral connector 121 (only the lateral connector 121 of the lateral portion 119 is depicted in Fig. 4, but there is an additional lateral connector 121 at the lateral portion 120) configured to be selectively actuated for providing a rigid connection to a respective lateral connector of a dividing panel of an adjacent lane divider device (wherein the adjacent lane divider is a lane divider device according to any embodiments of the invention) and/or to a wall of the swimming pool 2 (e.g. a lateral wall of the swimming pool 2 being parallelly arranged with respect to the at least one lane 20 to be divided). It some embodiments, the rigid connection to a wall of the swimming pool 2 may be replaced by a rigid connection to the support means 30 of the main structure 10 being arranged proximal to said wall. The lateral connectors 121 improve the stability of the dividing panels 110 when the lane divider device 11 is arranged in its extended position "A".

[0068] Fig. 4 indicates the position of the lateral connectors 121, but does not show the lateral connectors 121 being extended/deployed for connecting the shown dividing panel 110 to an adjacent dividing panel 110 (or to an adjacent wall - e.g. lateral wall - of the swimming pool 2). Thus, although not shown in Fig. 4, each lateral connector 121 may comprise a respective male and/or a respective female connector. In preferred embodiments, the lateral connector 121 of one lateral portion 119 may be configured as a deployable/extendable bar/rod or as an articulated bar/rod configured to be connected to the lateral connector 121 (e.g. a female connector) of the adjacent lateral portion 120 of an adjacent dividing panel 110. The lateral connectors 121 may further comprise a respective actuator configured to automatically activate and/or lock de lateral connector 121.

[0069] Although is not shown in Fig. 4, each lateral connector 121 may further comprise a respective auxiliar connector configured to be connected to a lane rope being external to the pool divider device. The auxiliar connector may be configured as a ring/eye-ring and/or may be arranged in in a position of the lateral connector being centrally arranged between the two adjacent dividing panels 110 being connected.

[0070] In preferred embodiments, and for the purpose of improving the overall rigidity of the pool dividing device 1, the dividing panel 110 may comprise at least two connectors 121 arranged at each opposing lateral portion 119, 120 (e.g. at different heights of the dividing panel 110, such that, per each side, one connector 121 is arranged above the water level L of the swimming pool 2 and one connector 121 is arranged below the water level L of the swimming pool 2).

[0071] The dividing panel 110 of the lane divider device 11 of Fig. 4 further comprises a transversal structural element 118 (which is an optional feature of the invention) rigidly connected to the dividing panel 110 and arranged transversely with respect to the dividing panel 110. The transversal structural element 118 is configured to extend over a whole transverse extension of the dividing panel 110 (i.e. between the two opposing lateral portions 119, 120 of the dividing panel 110). It should be noted that Fig. 4 represents a preferred embodiment, but in other compatible embodiments, the number of transversal elements 118 may be different (e.g. at least one or at least two). Further, each transversal element 118 according to said compatible embodiments may be configured to extend along at least a part of the transverse extension of the respective dividing panel 110.

[0072] Each transversal structural element 118 may be configured to be an integral part of the support structure 113 (i.e. the support structure 113 may comprise said at least one transversal structural element 118, as is the case of Fig. 4) or may be rigidly connectable/connected to the support structure 113.

[0073] In the preferred embodiment shown in Fig. 4, the dividing panel 110 of the lane divider device 11 is configured such that the (at least one) transversal structural element 118 extends transversely between the two opposing lateral portions 119, 120, wherein the lateral connectors 121 are arranged at respective ends of the transversal structural element 118 (this arrangement of the lateral connectors 121 representing an optional feature of the invention).

[0074] Fig. 5 depicts a front view of a pool divider device 1 according to the invention, and compatible with the embodiments shown in the preceding figures. As previously described for Fig. 1, the main structure 10 of Fig. 5 is also configured to have a separation distance H (e.g. a height distance) from a water level L of the swimming pool 2. Each of the dividing panels 11 may be configured according to any of the embodiments for the dividing panels 11 described in the preceding figures. Further, the main structure 10 may be configured as a modular structure comprising a plurality of interconnectable main structure modules 101 (as the ones depicted in Figs. 3A and 3B). Thus, the main structure 10 may be configured as a plurality of main structure modules 101 interconnected to each other, thereby forming the main structure 10, wherein the lane divider devices 11 may be connected

to a respective main structure module 101 (e.g. by each lane divider device being connected to a respective main structure module 101, or by providing groups of lane dividers devices 11 - e.g. at least two lane dividers devices 11 - connected to each main structure module 101). However, in alternative embodiments, the main structure 10 may be formed as a single-body structure (i.e. the main structure 10 comprising a single module 101 or the main structure 10 not being a modular structure), wherein the plurality of lane divider devices 11 may be connected to the main structure 10 (or to the single module 101 of the main structure).

[0075] Fig. 5 further shows that each dividing panel 110 comprises respective lateral connectors 121 (optional feature). The lateral connectors 121 depicted in the figure are configured to connect each dividing panel 110 to a respective adjacent dividing panel 110 or to a wall of the swimming pool 2 (c.f. dividing panel 110 arranged at the left side of the front view). The lateral connector 121 arranged at a lateral portion 119 of the dividing panel 110 being adjacent (i.e. the lateral portion 119) to a wall of the swimming pool 2 may be configured to provide a rigid connection to said wall and/or to the support means 30 of the main structure 10.

[0076] Fig. 5 further shows the position of one of the support means 30 relative to the swimming pool 2. The support means 30 shown in Fig. 5 is schematically represented. Although not specifically visible in Fig. 5, the support means 30 may be configured as static supports or as supports configured to allow the displacement of the main structure 10 (and therefore of the lane divider devices 11 and the pool divider device 1 itself) along the longitudinal direction "X" of the lane 20 to be divided (c.f. Fig. 1).

[0077] Fig. 5 shows a single support means 30, however it should be noted that a corresponding additional support means 30 may be arranged at each side of the swimming pool 2, wherein these two support means 30 may be configured equivalently to be static or to be movable along a travel guide of the swimming pool 2 (i.e. the travel guide being arranged along, or parallel to, the longitudinal direction "X" of the lane 20 to be divided). When the one or more support means 30 are configured to be movable, they may comprise wheels to be movable along a ground/floor proximal to the swimming pool 2. In some embodiments, the support means 30 may comprise braking means configured to secure the support means 30 in a particular position along the longitudinal direction "X". In alternative embodiments, the main structure 10 may be configured as a suspended structure (e.g. a hanging structure) configured to movable along the longitudinal direction "X".

[0078] The one or more support means 30 of Fig. 5 may be configured to be manually movable along the longitudinal direction "X" or may comprise one or more means (e.g. automatic means of automated movement) configured for allowing an automatic movement of the support means 30 (i.e. and thereby of the pool divider device 1) along the longitudinal direction "X" of the lane 20 to be divided into two shorter lanes 21, 22.

[0079] Figs. 6A to 6E depict respective detailed views of a pool divider device 1 (e.g. a pool divider device being compatible with any of the preceding embodiments) in which a lane divider device 11 is arranged in its extended position "A". In particular, the embodiment of Figs. 6a to 6E corresponds to those previously shown in Figs. 3A, 3B and 4, wherein the lane divider device 11 is movable connected to the main structure 10 by means of two respective articulations 116. Fig. 6A shows a lateral view of part of the pool divider device 1 and Fig. 6B shows detailed view of some of features specifically of the lane divider device 11 (wherein the main structure 10 has been hidden).

[0080] The lane divider device 11 of Figs. 6A-6E comprises an actuator 111 (i.e. a main actuator 111) configured to cause the lane divider device 11 to move between the extended position "A" (shown in Figs. 6A-6E) and the retracted position "B" (shown in Figs. 7A and 7B). The actuator 111 is configured as an automatic actuator 111 being a mechanical actuator (or as an electro-mechanical actuator). In particular, the actuator 111 shown in the figures is configured as a linear actuator 111 that can be controllably actuated to extend and retract partially or totally, therefore causing the lane divider device 11 to move accordingly between its two positions. It should be noted, however, that in other embodiments, the actuator 111 may be configured to meet any of the previously described configurations for the actuator 111. The linear actuator 111 may be configured as an electro-mechanical actuator or as a hydraulic actuator or a pneumatic actuator. The actuator 111 may be further (optionally) configured to block/retain the lane divider device 11 in its extended "A" and/or in its retracted "B" positions (e.g. by actively providing a force (e.g. a continuous force) between the main structure 10 and the lane divider device 11 when the latest is arranged one of its positions, namely the extended "A" and/or the retracted "B" position).

[0081] The pool divider device 11 shown in Figs. 6A to 6E comprises one or more locking means 124, 125 (which is an optional feature of the embodiments) configured to lock (e.g. to lock/block or rigidly engage, i.e. to secure its position) the lane divider device 11 to the main structure 10 in its respective extended position "A" and/or in its respective retracted position "B".

[0082] The one or more locking means 124, 125 may comprise: an extended position locker 124 (i.e. a locker configured to lock the lane divider device 11 in its extended position "A") and/or a retracted position blocker 125 (i.e. a locker configured to lock the lane divider 11 device in its retracted position "B"). The particular configuration represented in Figs. 6A-6B comprises both types of lockers 124, 125. It should be noted that, although the extended position locker 124 and the retracted position locker 125 are shown in the figures in combination with specific configurations for the support structure 113 (specially for the auxiliary structural portion 122), these lock-

ers are compatible with other geometric configurations of the support structure 113.

[0083] The extended position locker 124 (or locker for the extended position "A") visible in Figs. 6A-6B is configured to selectively lock (i.e. and unlock) the end portion 123 of the auxiliary structural portion 122 of the support structure 113 of the lane divider device 11 (e.g. the respective end portions 123 of the at least two structural arms 122 of the support structure 113) to the main structure 10 when the lane divider device 11 is its extended position "A". The combination of an extended position locker 124, with an actuator 111 (i.e. the main actuator 111 causing the displacement of the lane dividing device 11) and the articulation 116 provides three different connections areas between the lane divider device 11 and the main structure 10, such that the stability of lane divider device 11 when arranged it is extended position "A" is highly reinforced as a result of this combination.

[0084] The configuration shown for the extended position locker 124 comprises (at least) one respective actuator 1241 configured to automatically lock the extended position locker 124. The at least one actuator 1241 may be configured as a mechanical and/or as an electro-mechanical actuator, wherein the at least one actuator 1241 is preferably configured as a linear actuator (as shown in Figs. 6A and 6B. In other embodiments, the linear actuator may be replaced or complemented by a solenoid actuator, however the linear actuator is a preferred solution since it may configured to provide a continuous force (e.g. a traction force) lengthwise its body between the main structure 10 and the rest of the lane divider device 11 (e.g. the support structure 113), thereby minimising the displacement of the respective dividing panel 110when a swimmer turns his swimming direction by pushing with his feet towards said dividing panel 110.

[0085] The extended position locker 124 shown in Figs. 6A and 6B further comprises two locking connectors 1242 which are optionally configured as respective clamps 1242 (e.g. mechanical clamps) configured to be controlled/activated by means of the at least one actuator 1241. In alternative embodiments, the locking connector 1242 may be configured as an electro-mechanical clamp having an electro-mechanical actuator integrated (and therefore not requiring the optional configuration for the actuator 111 shown in Figs. 6A and 6B). It is noted that in Fig. 6B the main structure 10 has been removed on behalf of comprehensibility.

[0086] The clamps 1242 shown in Figs. 6A and 6B are configured as mechanical clamps configured to clamp the end portion 123 of end portion 123 of the auxiliary structural portion 122 of the support structure 113 of the lane divider device 11. More particularly, the clamps 1242 are configured to clamp the respective end portions 123 (e.g. the support or bracket 1231 thereto) of the respective end portions 123 of the at least two structural arms 122 of the auxiliary structural portion 122 the support structure 113.

[0087] In the preferred embodiment shown in more detail in Fig. 6B, the extended position locker 124 comprises two locking connectors 1242 that are interconnected to each other such that a single respective actuator 1241 is configured to actuate (i.e. to lock/unlock) all the locking connectors 1241 (e.g. the clamps 1241) simultaneously. In this embodiment, the extended position locker 124 comprises at least one auxiliary connecting element 1243 (e.g. at least one auxiliary connecting rod/bar 1243) configured to interconnect the two locking connectors 1242 to each other such that they can be actuated simultaneously. The auxiliary connecting element 1243 is connected to each locking connector 1242 (e.g. to each clamp 1243) and to the respective actuator 1241 so that is not allowed to swivel together with the support structure 113 of the lane divider device 11 when moving between the extended "A" and the retracted "B" positions.

[0088] It should be noted that the actuator 111 (i.e. the main actuator 111 of the lane divider device 11, which is configured to cause the lane divider device to move between the extended "A" and the retracted "B" positions) may be configured to actively provide a force (e.g. a continuous force) between the main structure 10 and the lane divider device 11 to further improve the locking effect provided by the extended position locker 124.

[0089] Fig. 6C provide a detailed view (a cutaway section view of a front part of the articulation 116, wherein the vertical cutting plane is arranged coincident with respect to a central axis of the spherical bearing 116) of an articulation 116 compatible with the articulations of any of the embodiments previously described. In particular, Fig. 6C shows a front view of the articulation 116 that is identified in Fig. 6B with the reference sign 116 (i.e. the one that is arranged at the right side of Fig. 6B).

[0090] The articulation 116 shown in Fig. 6C comprises a respective spherical bearing 1161 configured to allow an oscillating adjustment between the lane divider device 11 (i.e. between the support structure 113 of the lane divider device 11) and the main structure 10. The spherical bearing 1161 is mounted around a pin/rod 1162 defining an axis of rotation. Thus, the spherical bearing 1161 helps to absorb mounting tolerances of the pool divider device 1 for ensuring a proper adjustment and movement of the lane divider device 11 relative to the main structure 10. The spherical bearings 1161 have proved to be particularly advantageous when the lane divider device 11 comprises two articulations 116 arranged at a part of the lane divider device 11 being distally arranged with respect to the dividing panel 110 (e.g. arranged at respective end portions 1141 of two elongated member 114 of the support structure 113). The effect of the spherical bearing 116 is even further enhanced when the lane divider device 11 further comprises an extended position locker 124, since the spherical bearing 1161 ensures a tight tolerance between the extended position locker 124 (e.g. the locking connectors 1242, such as clamps) and the auxiliary structural portion 122 (e.g. the end portions 123 or the bracket 1231 arranged thereto), thereby reducing undesired movements of the dividing panel 110

when a swimmer pushes against it (e.g. when a swimmer reverse his/her swimming direction pushing against the dividing panel 110). Thus, this configuration increases the stability of the dividing panel 110 when the lane divider device is arranged in its extended position "A".

[0091] Fig. 6D is a view of a front part of a pool divider device 1 comprising two retracted position lockers 125 (although in some embodiments the pool divider device 1 may be configured to comprise at least one retracted position locker 125), while Fig. 6E shows a detailed view of one of the retracted position lockers 125.

[0092] In the preferred embodiment shown in Figs. 6D and 6E, the pool divider device 1 depicted comprises a retracted position locker 125, which is an optional feature of the lane divider device 11. The retracted position locker (or locker for the retracted position "B") is configured to selectively lock (i.e. and unlock) the end portion 123 of the auxiliary structural portion 122 of the support structure 113 of the lane divider device 11 (e.g. the respective end portions 123 of the at least two structural arms 122 of the support structure 113) to the main structure 10 when the lane divider device 11 is in its retracted position "B". In Figs. 6D and 6E the retracted position locker 125 is configured to lock the support or bracket 1231 (e.g. by providing a connecting hole in said bracket 1231), although this embodiment is compatible with other configurations.

[0093] Each retracted position locker 125 further comprises a respective actuator 1251 configured to automatically lock and/or unlock the retracted position locker 125 when the lane divider device 11 is arranged in its retracted position "B". The actuator 1251 may be configured as a mechanical or as an electro-mechanical actuator, wherein the actuator is preferably configured as a linear actuator or as a solenoid actuator. In the embodiment shown in Fig. 6A-6E, the extended position locker 125 is configured as (or comprises) a solenoid actuator 1251 configured to selectively lock the lane divider device 11.

[0094] According to some embodiments, the pool divider device 1 may be configured such that, when the actuator 111 (e.g. a main actuator 111) that causes the displacement of the lane divider device 11 between its extended position "A" and its retracted position "B" is configured as a linear actuator, then said actuator 111 may replace the function of the retracted position locker 125.

[0095] Figs. 7A and 7B show respective detailed views of the pool divider device 1 of Figs. 6A-6E in which the lane divider device 11 is arranged in its retracted position "B". Figs. 7A and 7B depict a configuration in which the retracted position locker 125 is configured to be connected to the optional bracket 1231 of the end portion 123 of the auxiliary structural portion 122 of the support structure 113.

[0096] Finally, Fig. 8 shows the pool divider device 1 of Figs. 6A-6E and 7A-7B in which the lane divider device 11 is an intermediate position between the extended "A" and the retracted "B" positions.

Claims

1. A pool divider device (1) for selectively dividing at least one lane (20) of a swimming pool (2) into two respective shorter lanes (21, 22), the device (1) comprising:

   a main structure (10) configured to be transversely arranged with respect to the at least one lane (20) to be divided into two respective shorter lanes (21, 22), wherein the main structure (10) is further configured to have a separation distance (H) from a water level (L) of the swimming pool (2) configured to allow a swimmer to pass below the main structure (10); wherein preferably the main structure (10) is configured as a plurality of main structure modules (101) interconnected to each other; and
   at least one lane divider device (11) connected to the main structure (10) and comprising a dividing panel (110), the lane divider device (11) being configured to be selectively movable between an extended position (A), in which the respective dividing panel (110) is arranged perpendicularly inserted into a respective lane (20) of the swimming pool (2) such that said lane (20) is divided into two shorter lanes (21, 22), and a retracted position (B), in which the respective dividing panel (110) is retracted from the respective lane (20) of the swimming pool (2) towards the main structure (10) such that a swimmer is allowed to pass below the main structure (10) and the dividing panel (110);
   wherein preferably the main structure (10) is configured to be movable along a longitudinal direction (X) extending along the at least one lane (20) to be divided, such that when the main structure (10) is displaced along the longitudinal direction (X), then the length of the two respective shorter lanes (21, 22) relative to the length of the at least one (20) to be divided is adjusted.

2. The pool divider device (1) of claim 1, wherein the lane divider device (11) comprises at least one actuator (111) configured to cause the lane divider device (11) to move between the extended position (A) and the retracted position (B);
   wherein preferably said at least one actuator (111) is configured as a mechanical or an electro-mechanical actuator, more preferably comprising a linear actuator and/or an electric motor.

3. The pool divider device (1) of claims 1 or 2, wherein the lane divider device (11) further comprises a respective support structure (113) configured for connecting the dividing panel (110) to the main structure (10), wherein the support structure (113) is rigidly connected to the respective dividing panel (110) and

movably connected to the main structure (10);
wherein preferably said support structure (113) is further configured such that, when the lane divider device (11) is arranged in its extended position (A), the dividing panel (110) protrudes from the water level (L) by a predetermined distance and the support structure (113) provides a separation space between the dividing panel (110) and the main structure (10).

4. The pool divider device (1) of claim 3, wherein the support structure (113) of the lane divider device (11) comprises at least one elongated member (114) extending from the respective dividing panel (110) to the main structure (10);

wherein preferably said support structure (113) comprises at least two or at least three elongated members (114) spaced apart from each other such that one or more air windows (115) are formed between the elongated members (114);
wherein more preferably the support structure (113) further comprises at least one interconnecting member (117) transversely arranged with respect to the elongated members (114) and configured to interconnect to each other at least two of the elongated members (14).

5. The pool divider device (1) of claims 3 or 4, wherein the support structure (113) of the lane divider device (11) further comprises an auxiliary structural portion (122) extending from a part (1141) of the support structure (113) distally arranged with respect to the dividing panel (110), wherein said auxiliary structural portion (122) is configured to extend at least partially along a direction being perpendicular or oblique to a geometric plane arranged centrally with respect to a thickness of the dividing panel (110), such that a respective end portion (123) of the auxiliary structural portion (122) is arranged at an offset distance from said geometric plane;
wherein preferably the auxiliary structural portion (122) comprises at least two structural arms (122), wherein the end portion of the auxiliary structural portion (122) comprises respective end portions (123) of the at least two structural arms (122), said end portions (123) being arranged at an offset distance from said geometric plane.

6. The pool divider device (1) of claims 3 to 5, wherein the dividing panel (110) of the lane divider device (11) is configured as a solid body or comprises two planar plates (1101), wherein each planar plate (1101) is arranged at a respective side of the support structure (113), such that, when the lane divider device (11) is arranged in its respective extended position (A), each planar plate (1101) is arranged facing a respective shorter lane (21, 22).

7. The pool divider device (1) of any of the preceding claims, wherein the lane divider device (11) further comprises one, two or more articulations (116) configured to movably connect the lane divider device (11) to the main structure (10), such that the lane divider device (11) is configured to swivel angularly between its respective extended position (A) and its respective retracted position (B);
wherein preferably the one or more articulations (116) of the lane divider device (11) are arranged at a part of the lane divider device (11) being distally arranged with respect to the dividing panel (110).

8. The pool divider device (1) of any of claim 7 and any of claims 3 to 6, wherein the one or more articulations (116) of the lane divider device (11) that are arranged at a part of the lane divider device (11) being distally arranged with respect to the dividing panel (110) are further arranged at a respective end portion (1141) of the at least one elongated member (114) of the support structure (113) being distally arranged with respect to the dividing panel (110);
wherein preferably said at least one elongated member (114) is configured such that, when the lane divider device (11) is arranged in its extended position (A), the at least one elongated member (14) is arranged vertically.

9. The pool divider device (1) of claims 7 or 8, wherein the at least one articulation (116) of the lane divider device (11) comprises a respective spherical bearing (1161) configured to allow an oscillating adjustment between the lane divider device (11) and the main structure (10)

10. The pool divider device (1) of any of the preceding claims, wherein the dividing panel (110) of the lane divider device (11) extends transversely between two opposing lateral portions (119, 120), wherein each lateral portion (119, 120) comprises a respective lateral connector (121) configured to be selectively actuated for providing a rigid connection to a respective lateral connector (121) of a dividing panel (110) of an adjacent lane divider device (11) and/or to a wall of the swimming pool (2);
wherein preferably each lateral connector (121) comprises a respective auxiliar connector configured to be connected to a lane rope being external to the pool divider device (1).

11. The pool divider device (1) of any of the preceding claims, wherein the dividing panel (110) of the lane divider device (11) further comprises at least one or at least two transversal structural elements (118) rigidly connected to the dividing panel (110) and arranged transversely with respect to the dividing panel (110).

12. The pool divider device (1) of claims 10 and 11, wherein the dividing panel (110) of the lane divider device (11) is configured such that the at least one transversal structural element (118) extends transversely between the two opposing lateral portions (119, 120), such that the lateral connectors (121) are arranged at respective ends of the transversal structural element (118).

13. The pool divider device (1) of any of the preceding claims, further comprising one or more locking means (124, 125) configured to lock the lane divider device (11) to the main structure (10) in its respective extended position (A) and/or in its respective retracted position (B).

14. The pool divider device (1) of claims 5 and 13, wherein the one or more locking means (124, 125) comprises:

an extended position locker (124) configured to selectively lock the end portion (123) of the auxiliary structural portion (122) of the support structure (113) to the main structure (10) when the lane divider device (11) is its extended position (A), wherein preferably said extended position locker (124) comprises a respective actuator (1241) configured to automatically lock the extended position locker (124); and/or
a retracted position blocker (125) configured to selectively lock the end portion (123) of the auxiliary structural portion (122) of the support structure (113) to the main structure (10) when the lane divider device (11) is its retracted position (B), wherein preferably said retracted position locker (125) comprises a respective actuator configured to automatically lock the retracted position blocker (125).

15. The pool divider device (1) of any of the preceding claims, comprising a plurality of lane divider devices (11), each lane divider device (11) being as described in any of the preceding claims;

wherein preferably the main structure (10) is configured as a plurality of main structure modules (101) interconnected to each other;
wherein more preferably each main structure module (101) comprises one or more lane divider devices (11) of the plurality of lane divider devices (11).

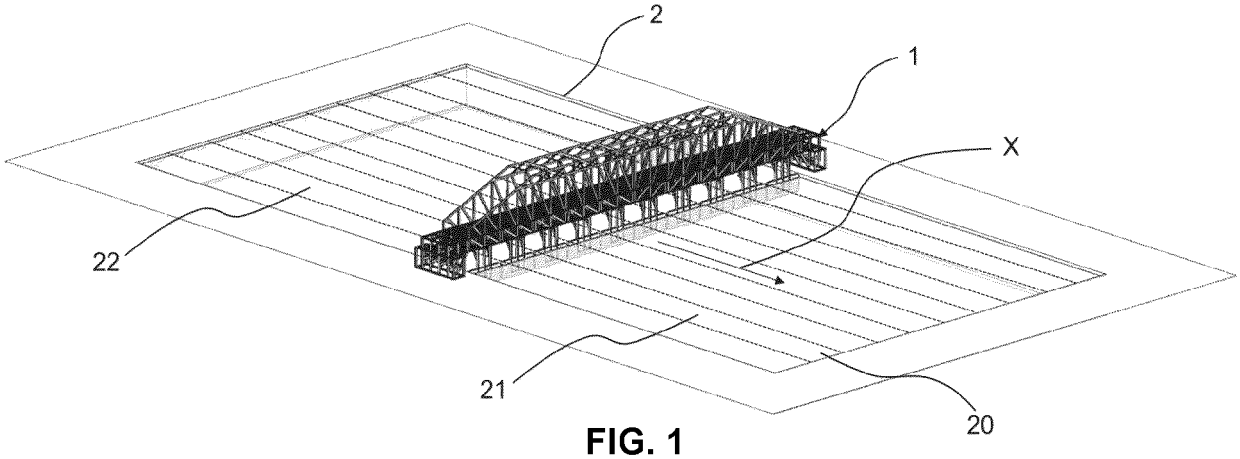

FIG. 1

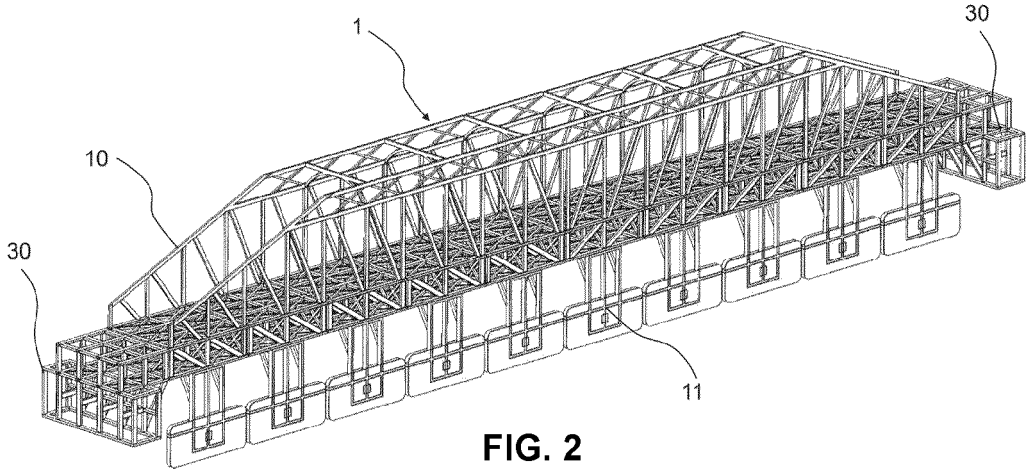

FIG. 2

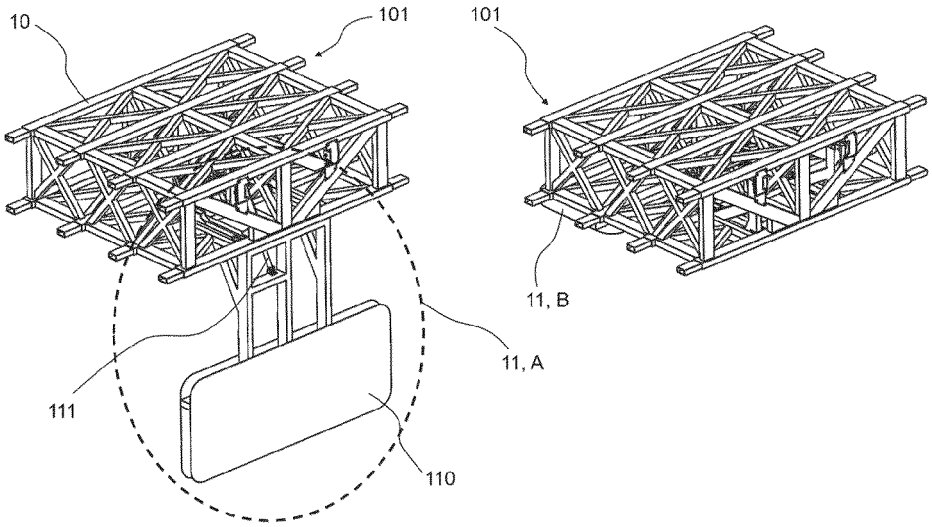

FIG. 3A

FIG. 3B

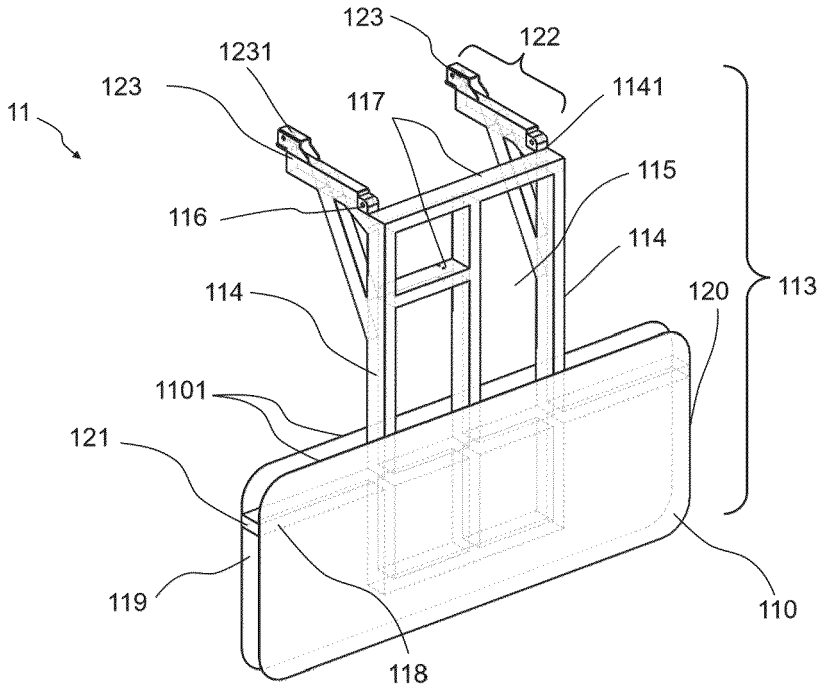
123
122
1231
123
1141
11
117
115
116
114
114
120
113
1101
121
119
110
118

FIG. 4

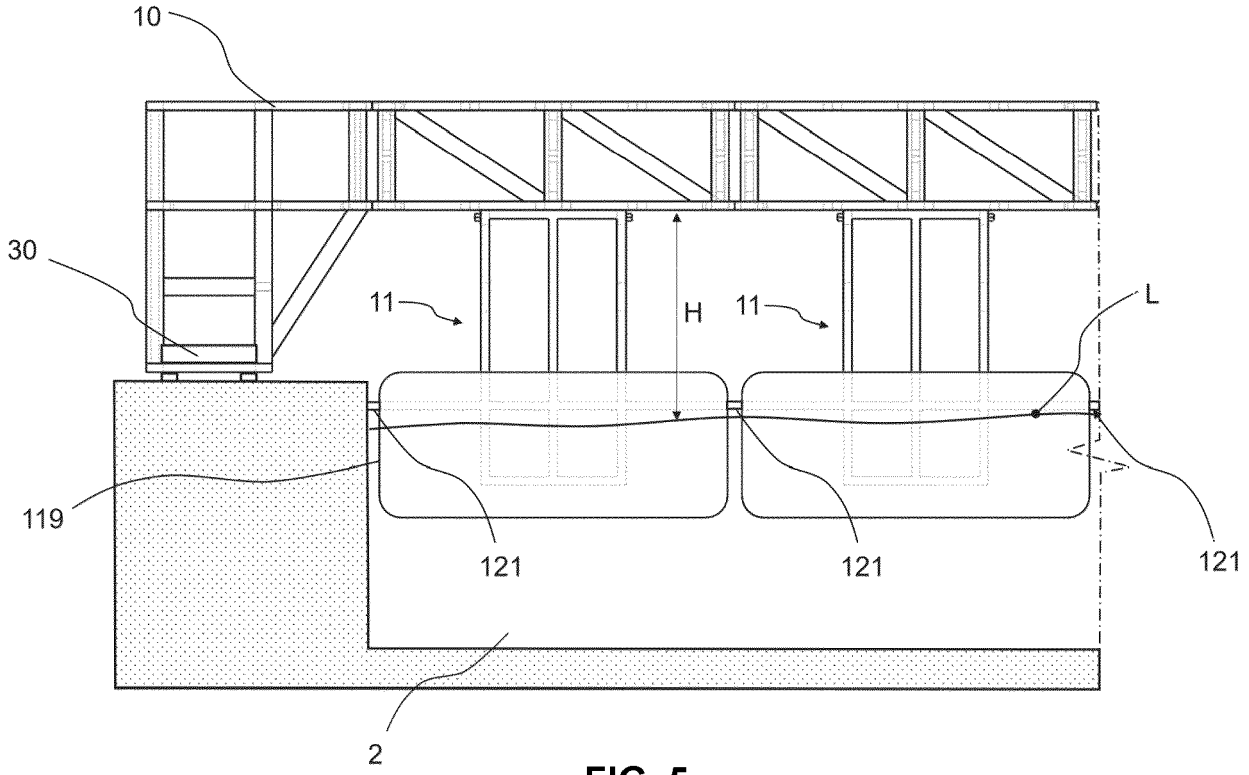
10
30
11
H
11
L
119
121
121
121
2

FIG. 5

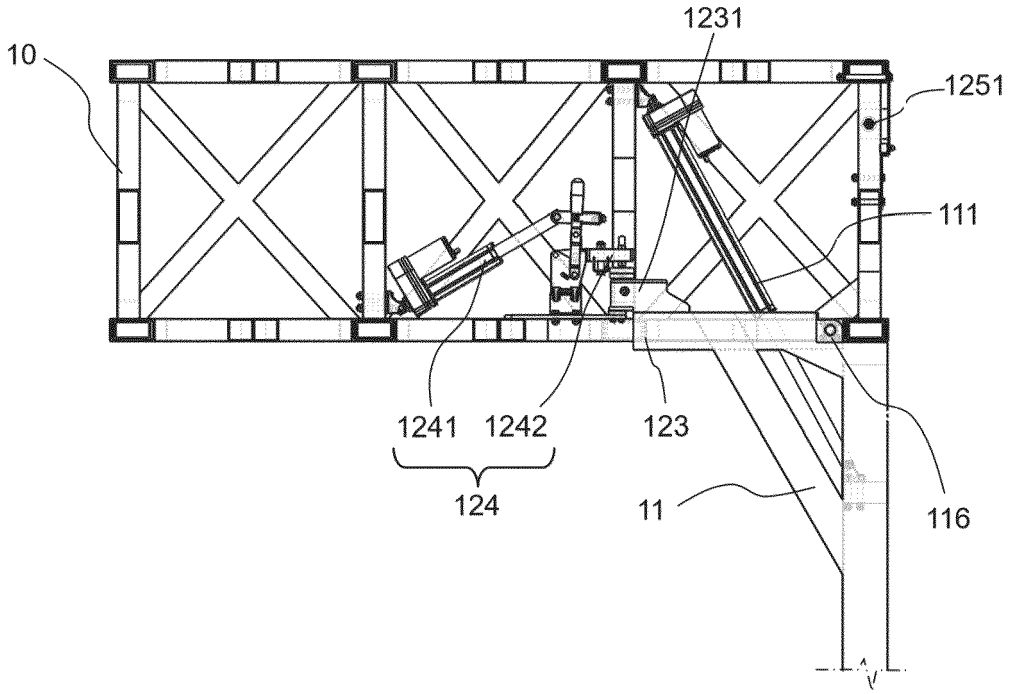
10
1231
1251
111
1241
1242
123
124
11
116

FIG. 6A

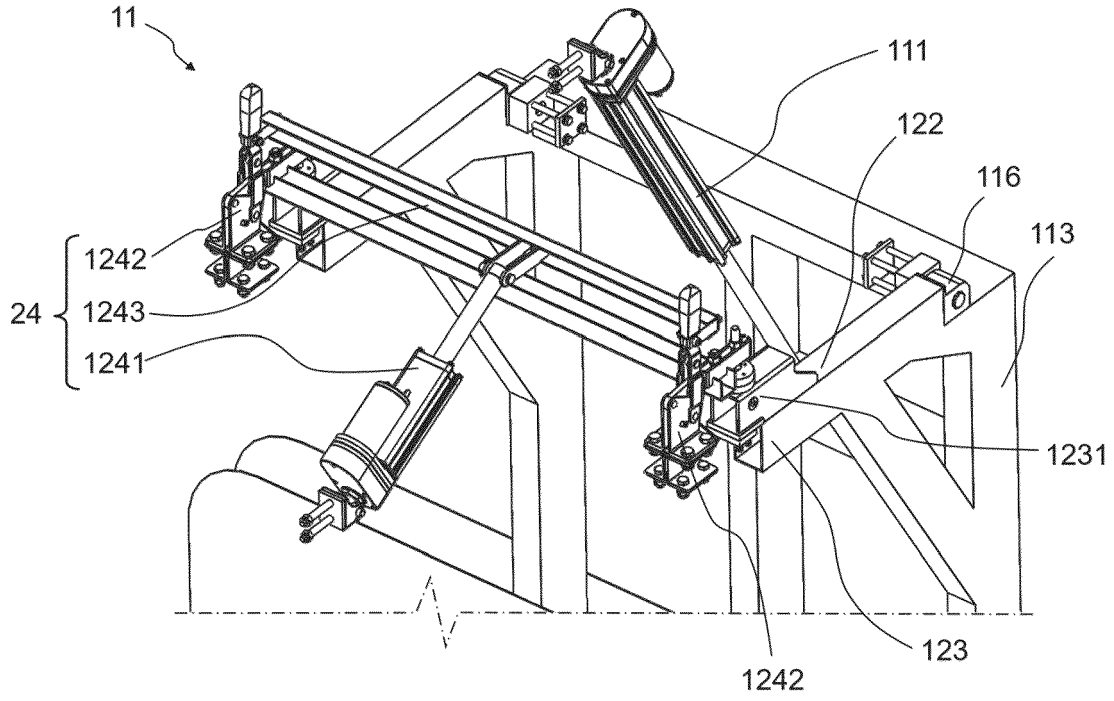
11
111
122
116
113
24
1242
1243
1241
1231
123
1242

FIG. 6B

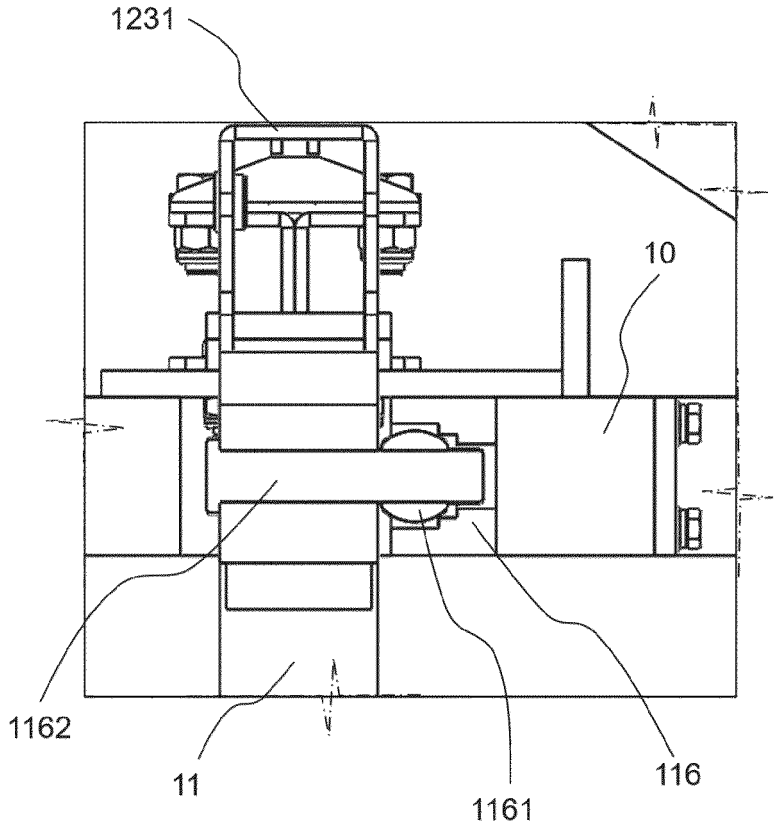

FIG. 6C

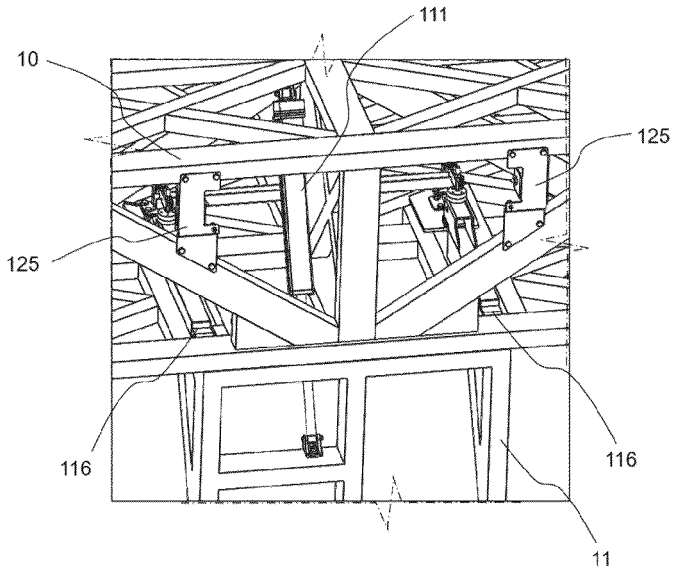

FIG. 6D

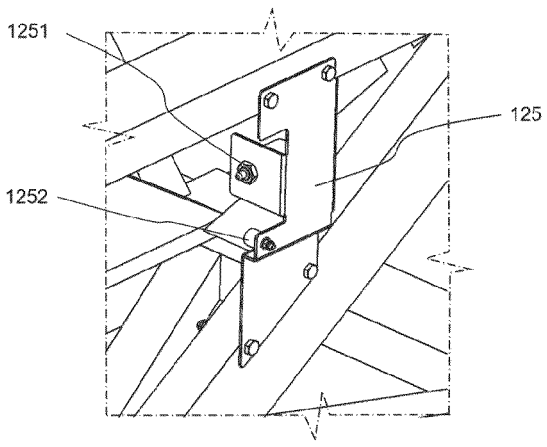

FIG. 6E

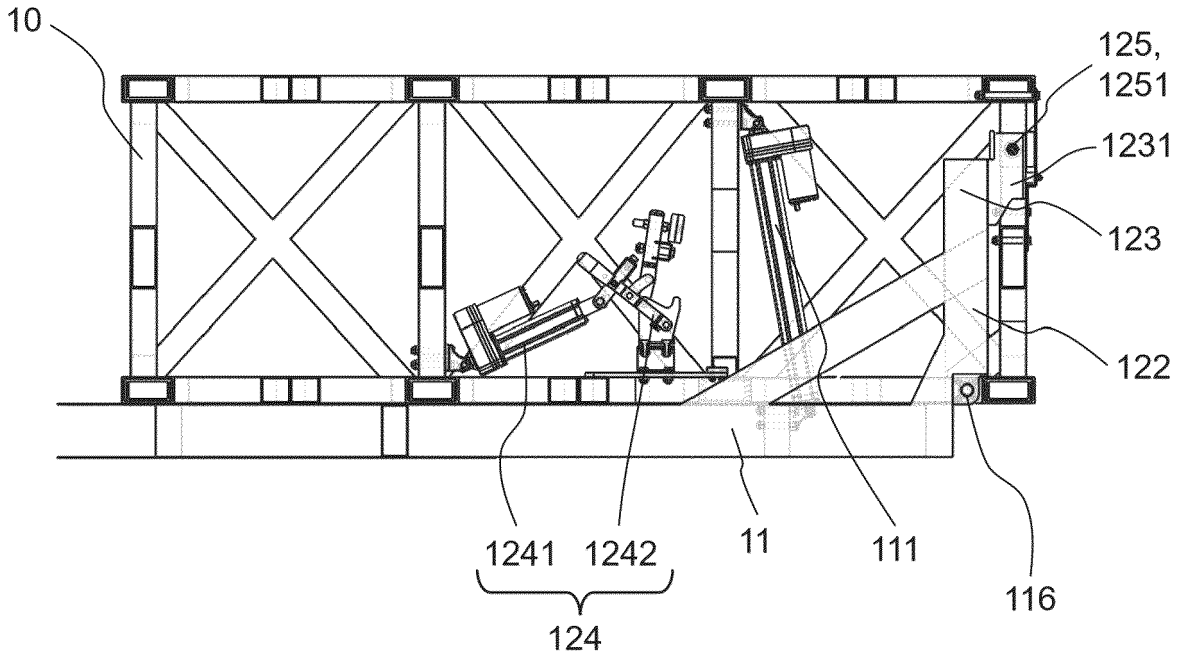

FIG. 7A

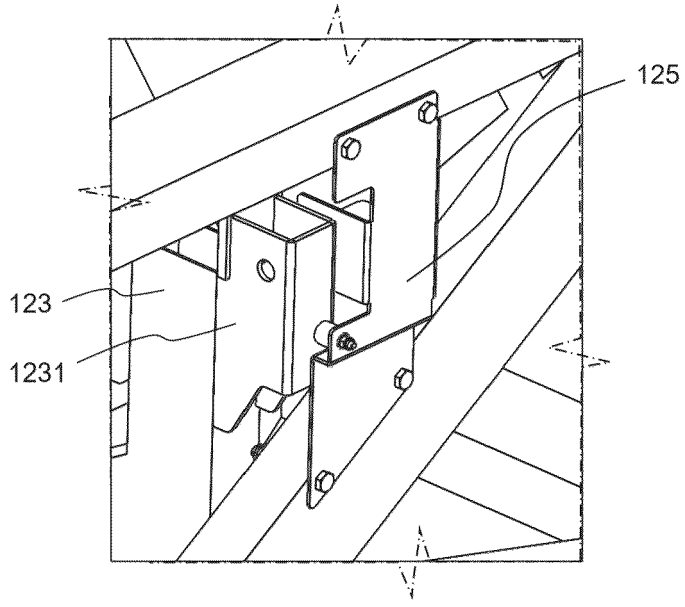

FIG. 7B

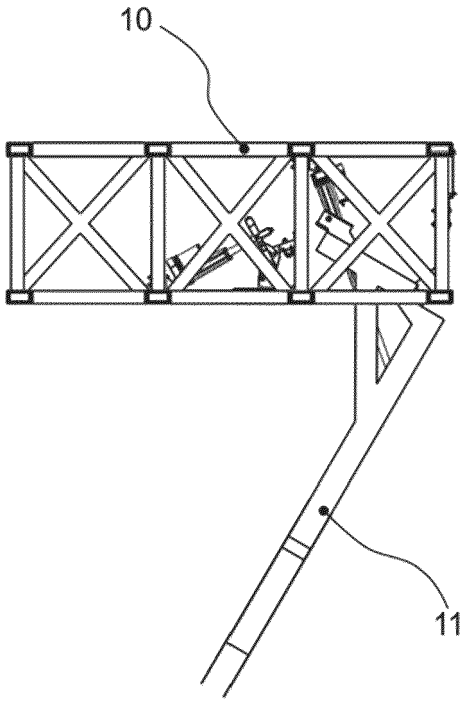

FIG. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 23 38 2575

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 4 707 869 A (RAY O EUGENE [US]) 24 November 1987 (1987-11-24) * column 1, line 66 - column 2, line 52; figures 1,2 *	1-15	INV. E04H4/14
A	US 2017/067267 A1 (GALLO MAXWELL [US]) 9 March 2017 (2017-03-09) * figure 1 * * paragraph [0016] - paragraph [0019] *	1-15	
A	KR 2022 0025586 A (SHIN MYOUNG CHEOL [KR]) 3 March 2022 (2022-03-03) * figure 7 * * paragraph [0030] - paragraph [0036] *	1-15	
A	US 4 292 696 A (BERGER GORDON) 6 October 1981 (1981-10-06) * column 2, line 43 - column 4, line 17; figure 1 *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC) E04H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	18 October 2023	Valenta, Ivar

CATEGORY OF CITED DOCUMENTS

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D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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18-10-2023

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82