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Nov. 29, 2001 (AU)..... PR 9188

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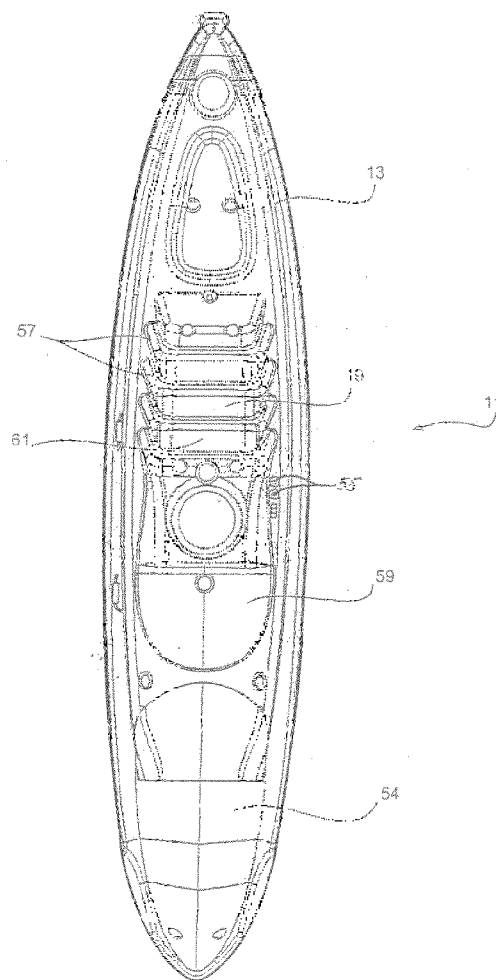
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01621, filed on Nov. 29, 2002.(30) **Foreign Application Priority Data**

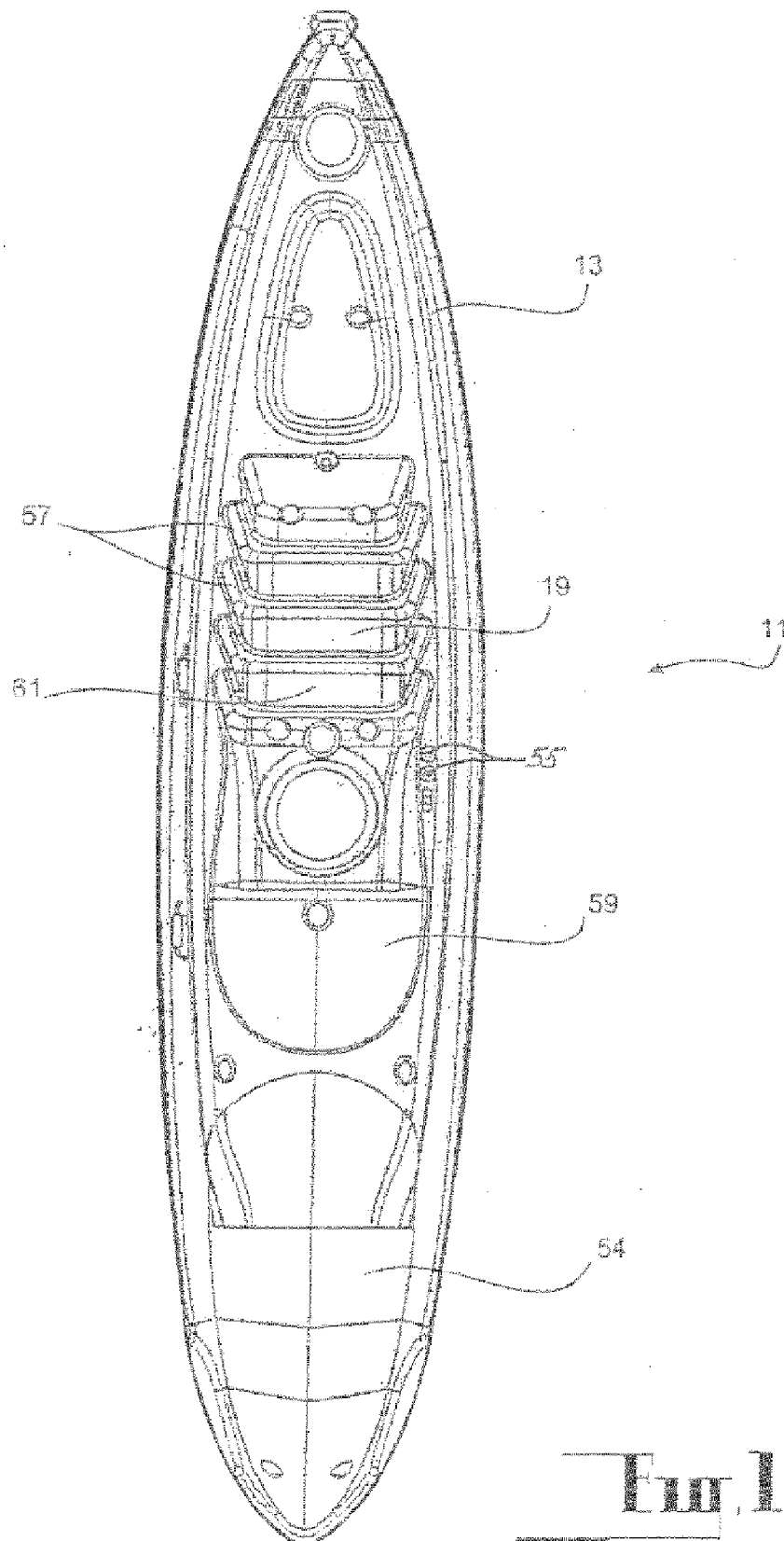
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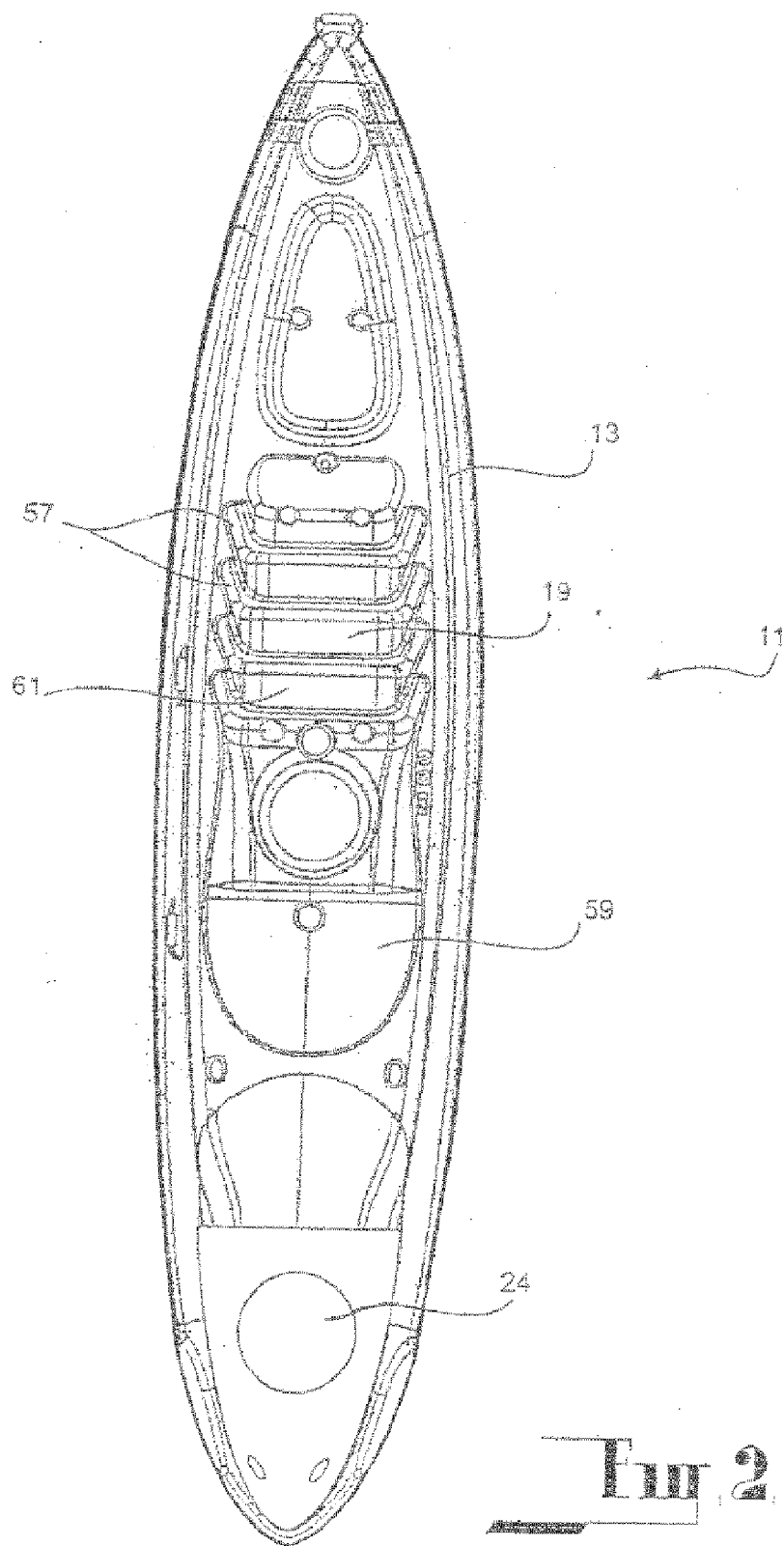
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**ABSTRACT**

A watercraft (11) comprising a shell having an upper skin (13) adapted to support at least one person, a lower skin (15) defining a hull (23) for contact with the water, an aperture (24) extending through the upper and lower skin and defined by a sidewall (100) enclosure between the lower skin (15) and the upper skin (23) to maintain the integrity of the shell, wherein the aperture (129) removably secures a propulsion system (31) for propelling the watercraft (11), such that a cavity within the shell remains watertight to allow for practical functioning when the propulsion system (31) is removed.







**Fig. 2**

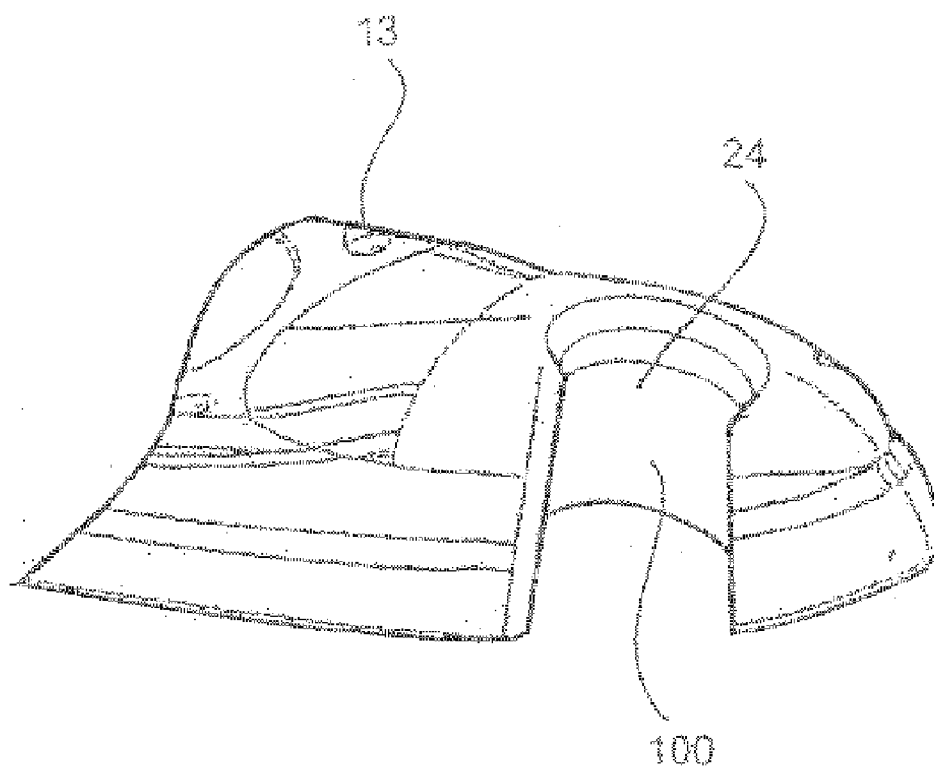


Fig. 3

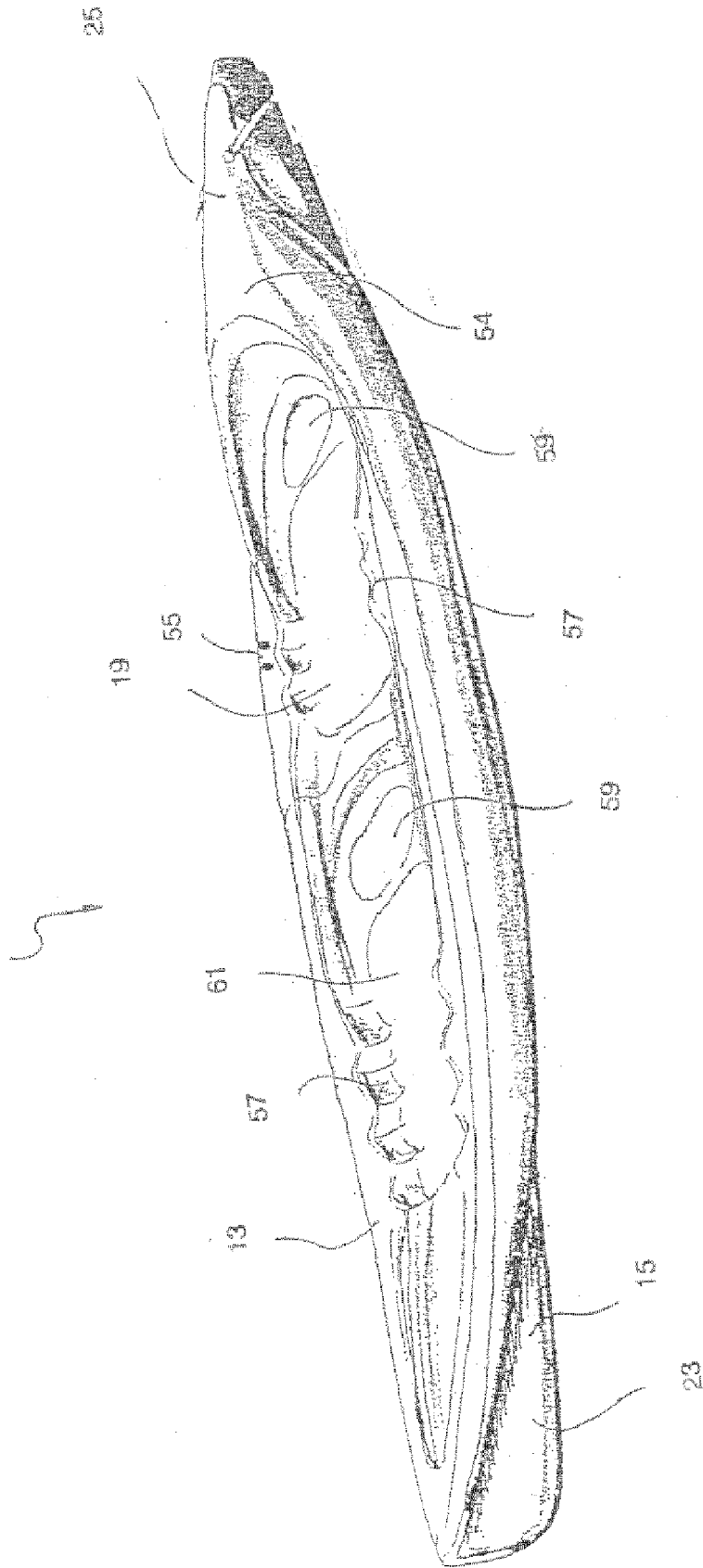
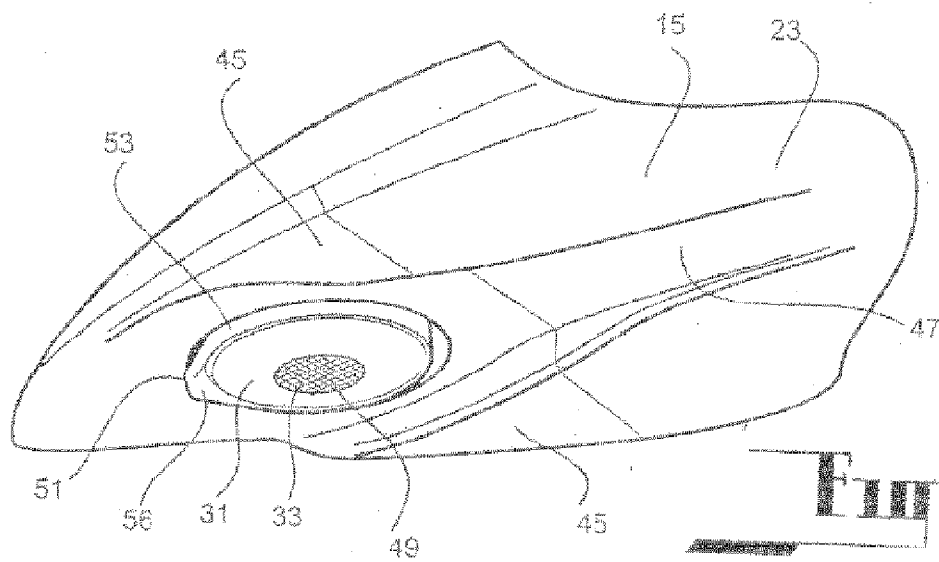
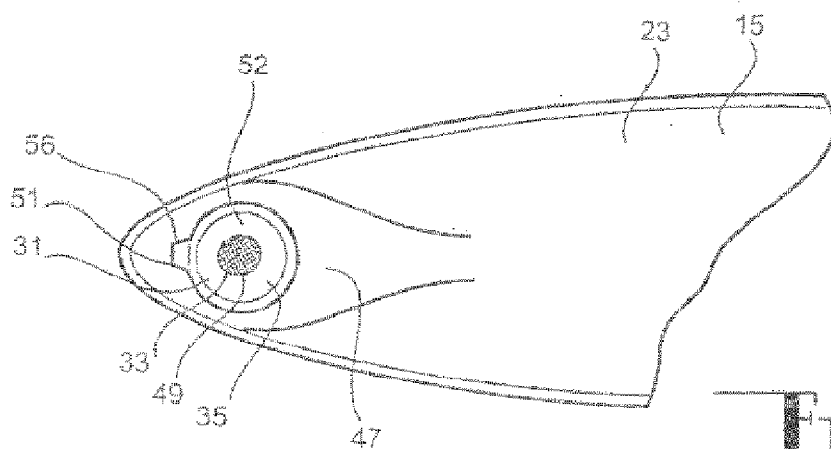


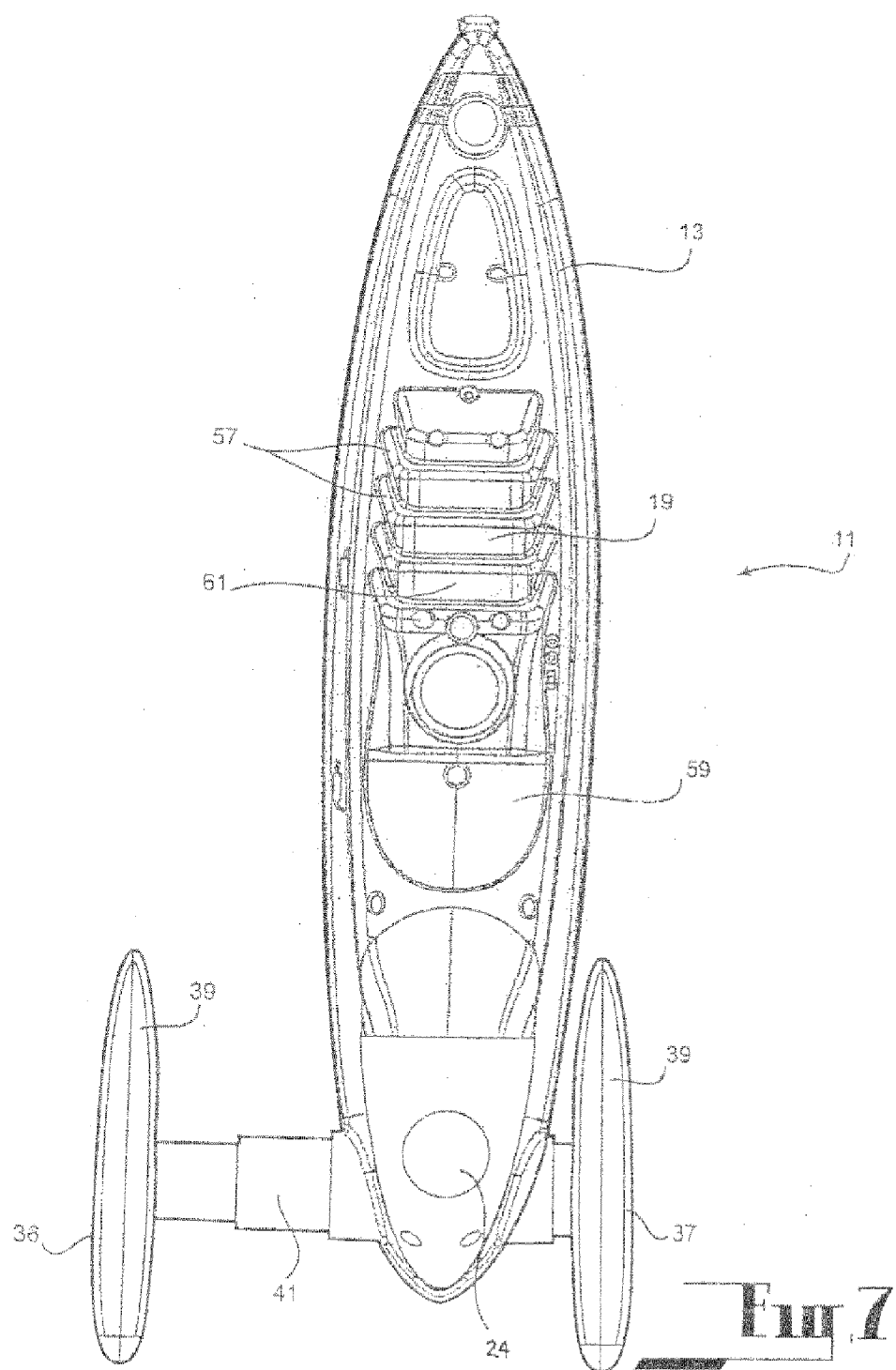
Fig. 4



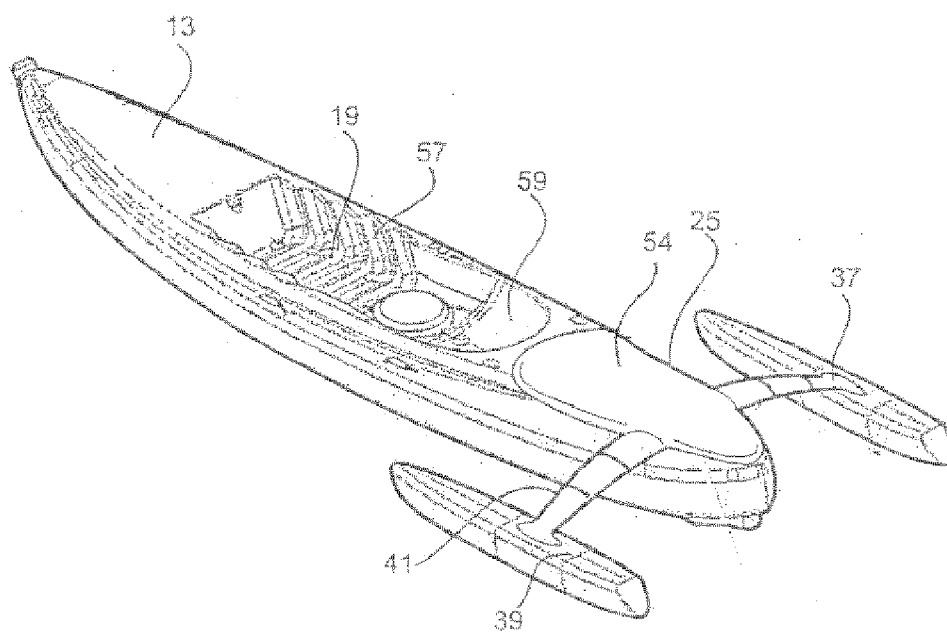
**Fig. 5**



**Fig. 6**



**Fig. 7**



**Fig. 8.**

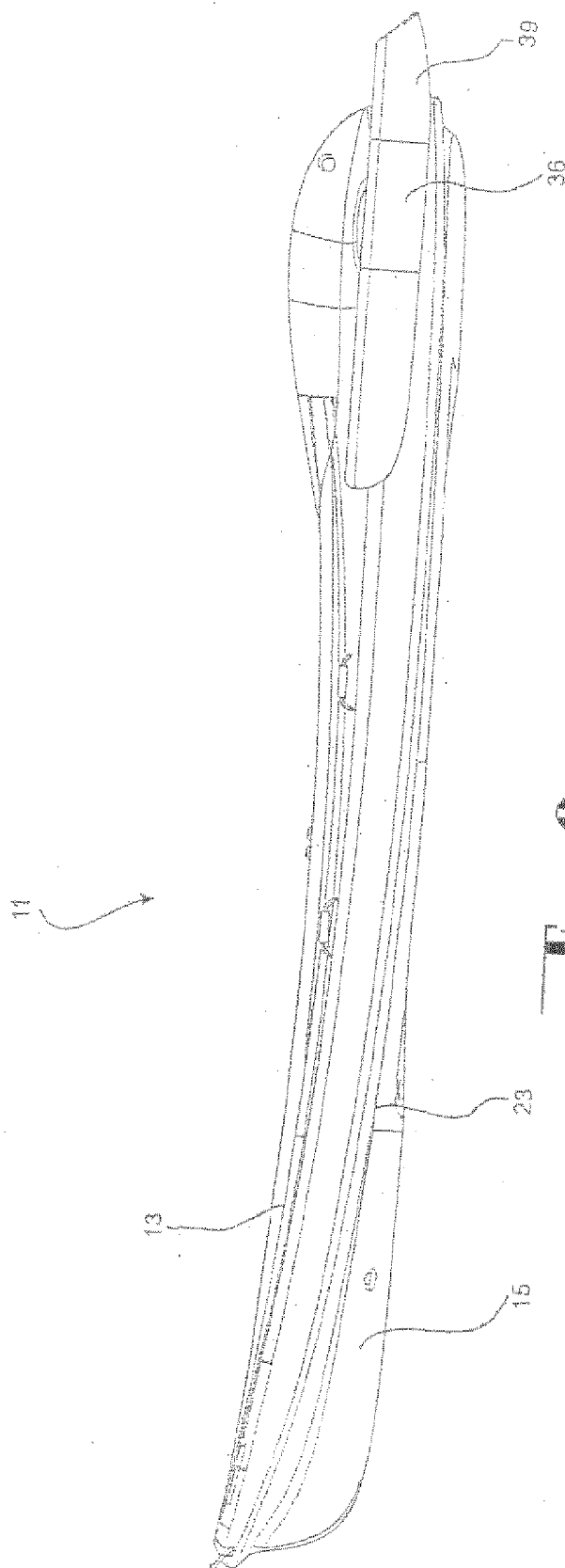
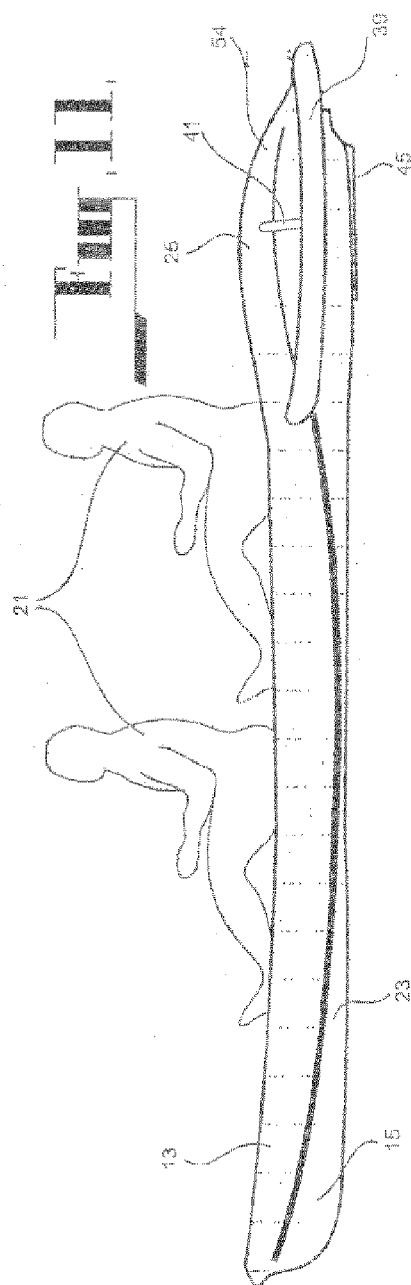
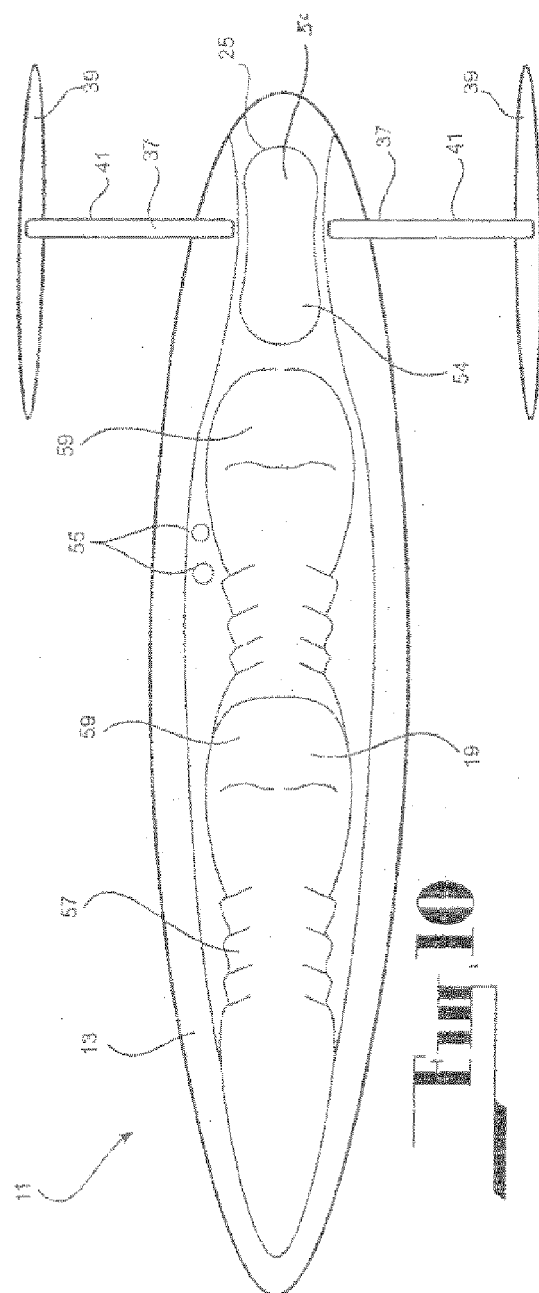
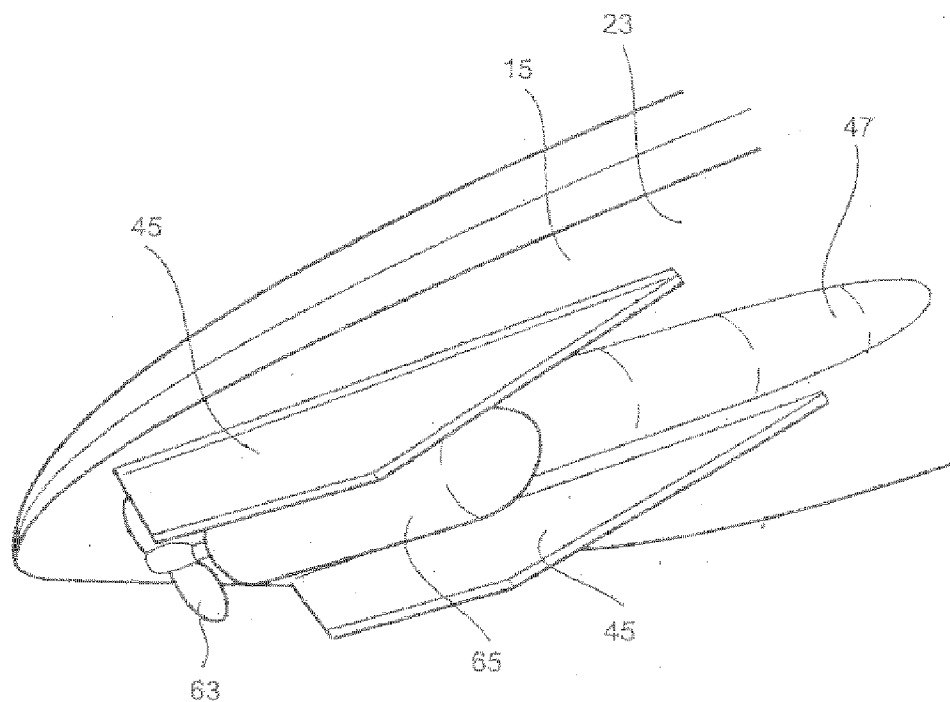
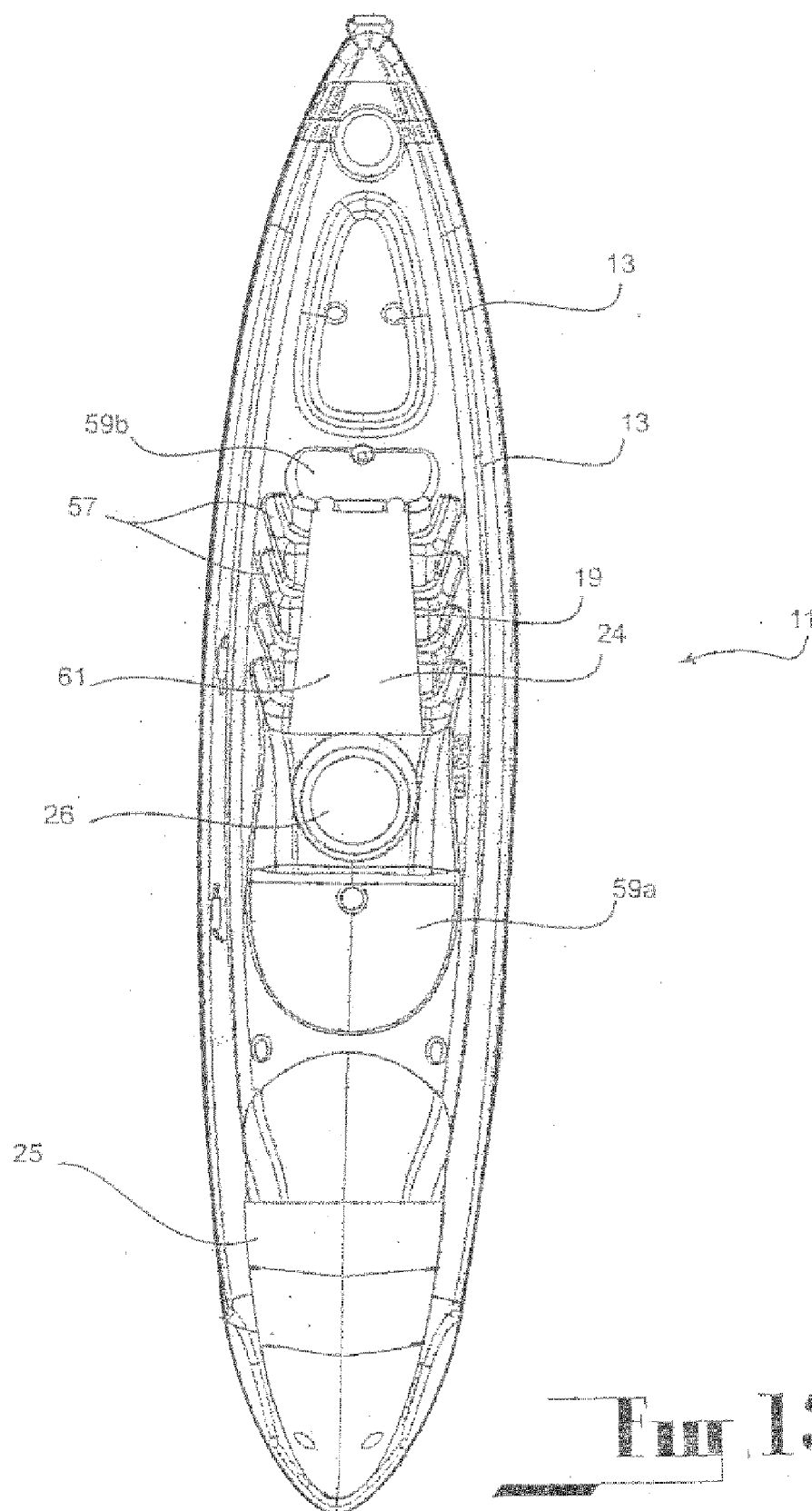


Fig. 9

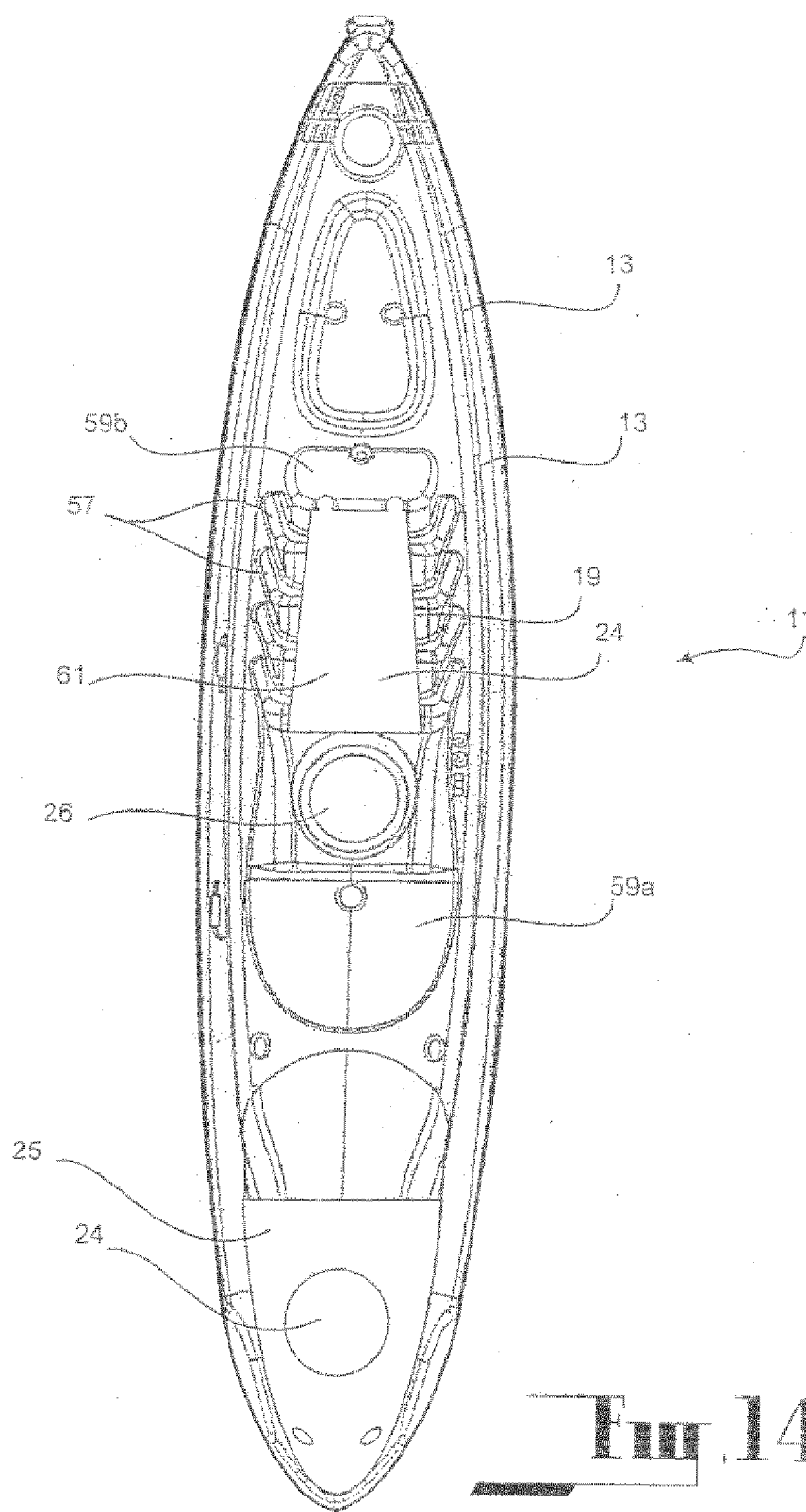




**Fig. 12**



**Fig. 13**



**Fig. 14**

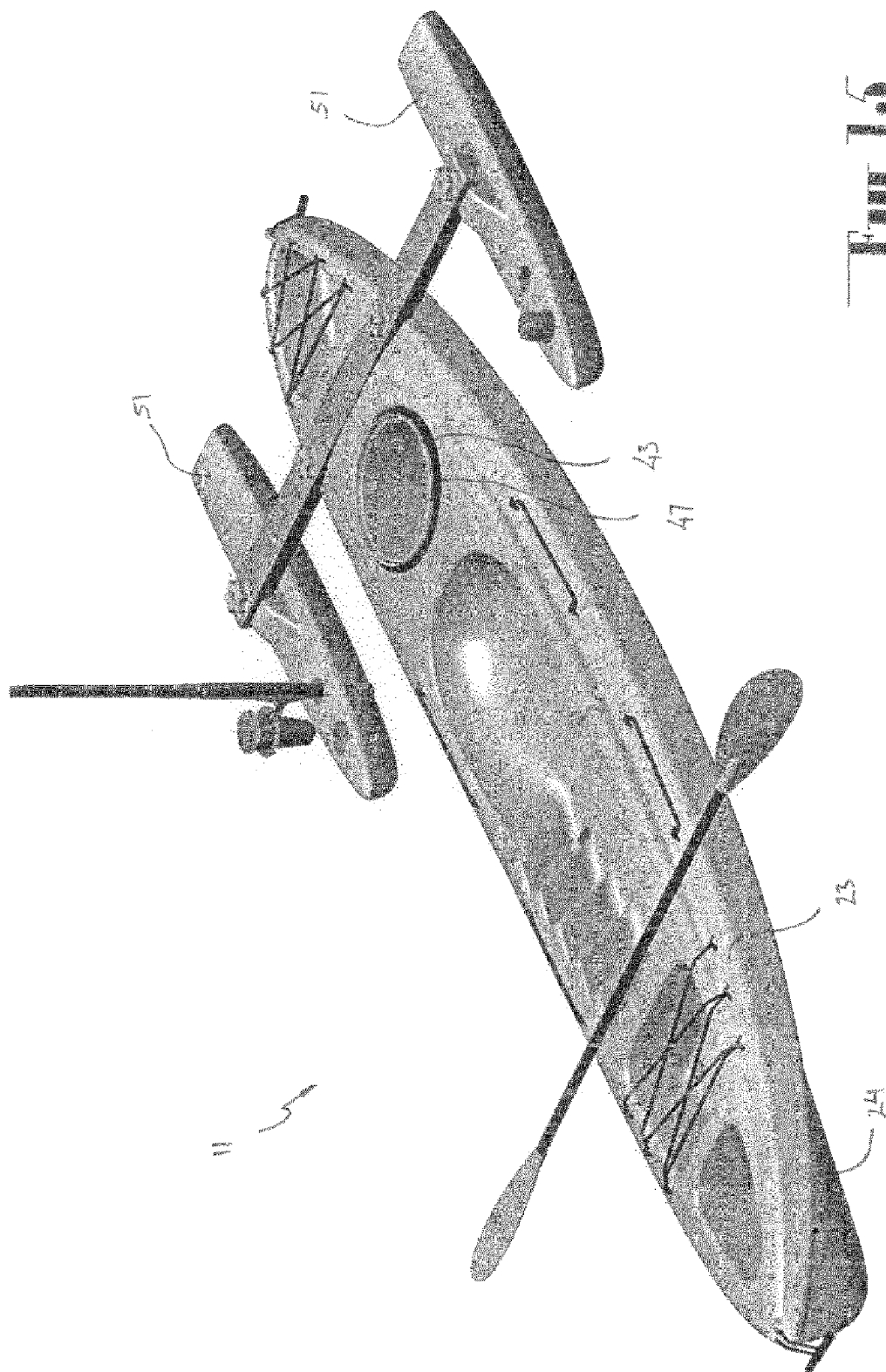


Fig. 16

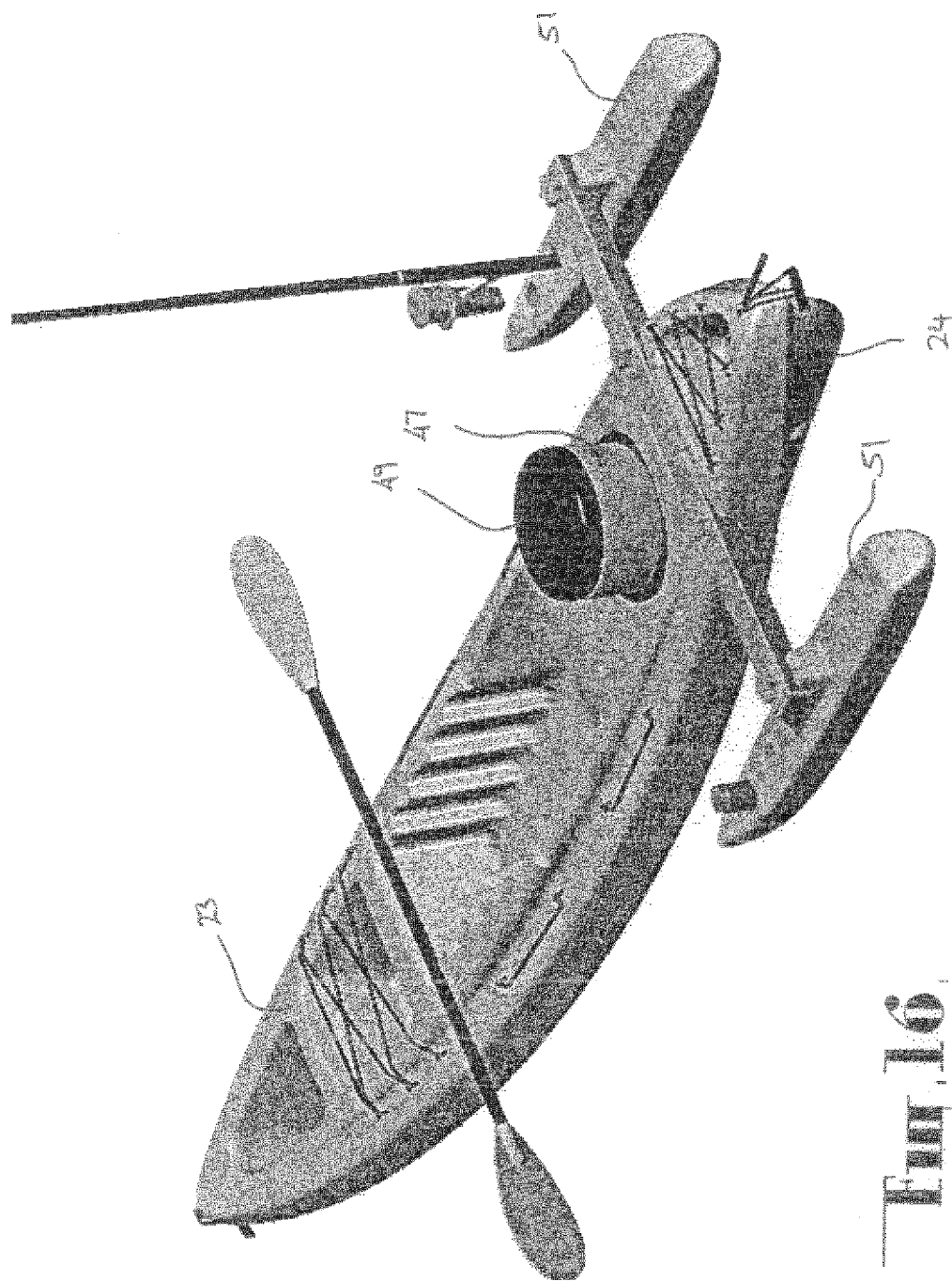
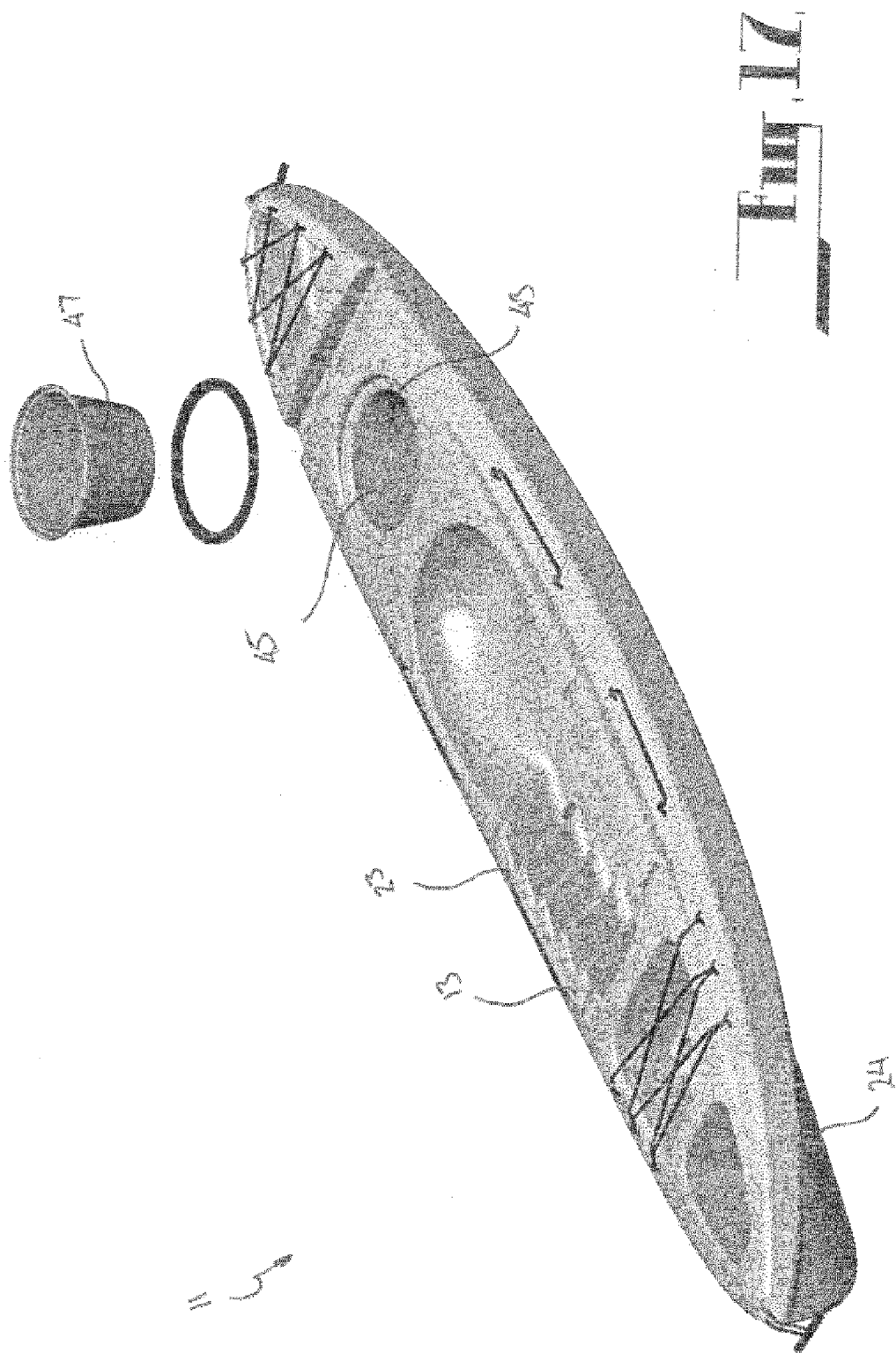
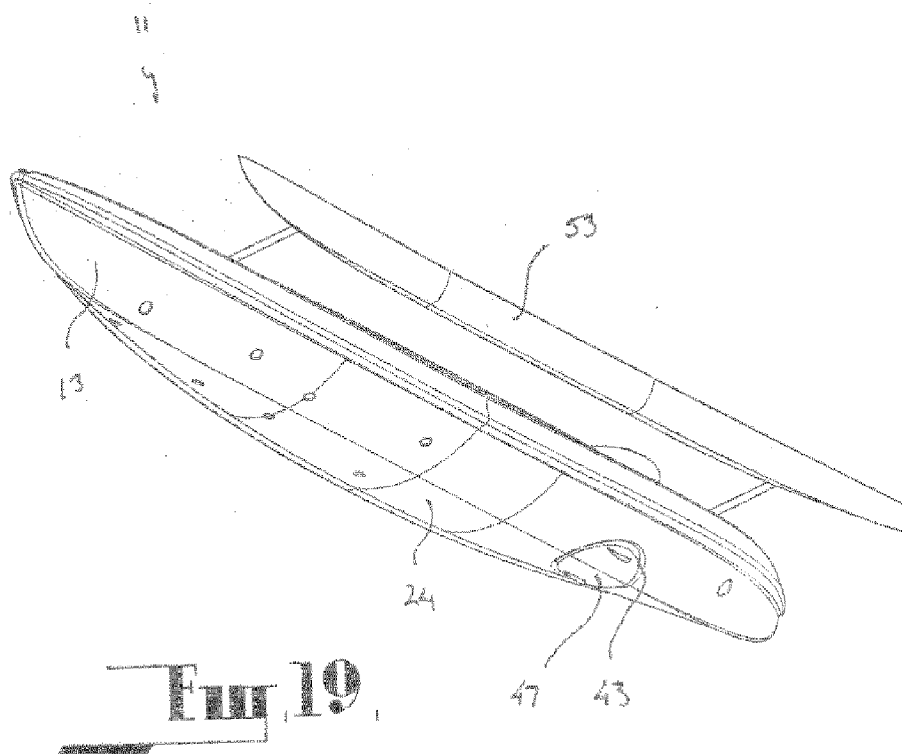
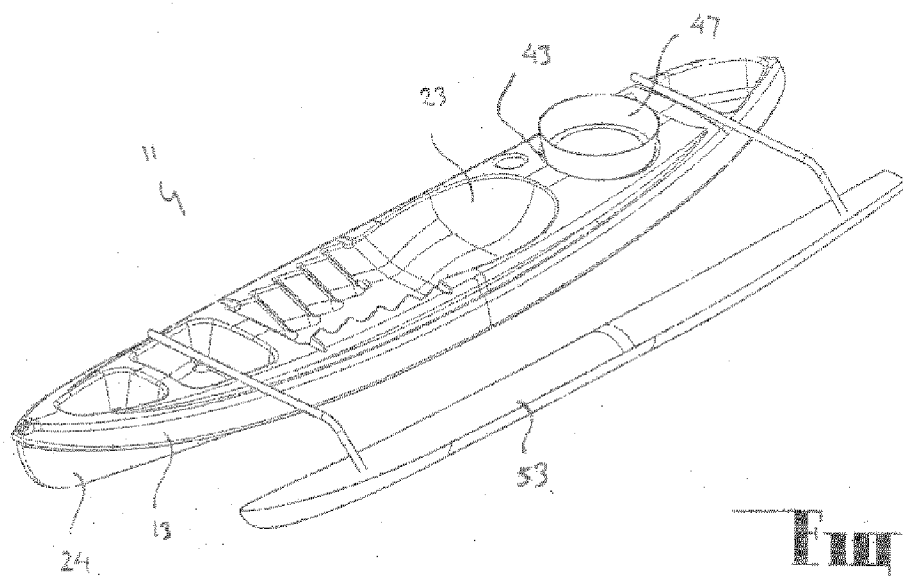


Fig. 16





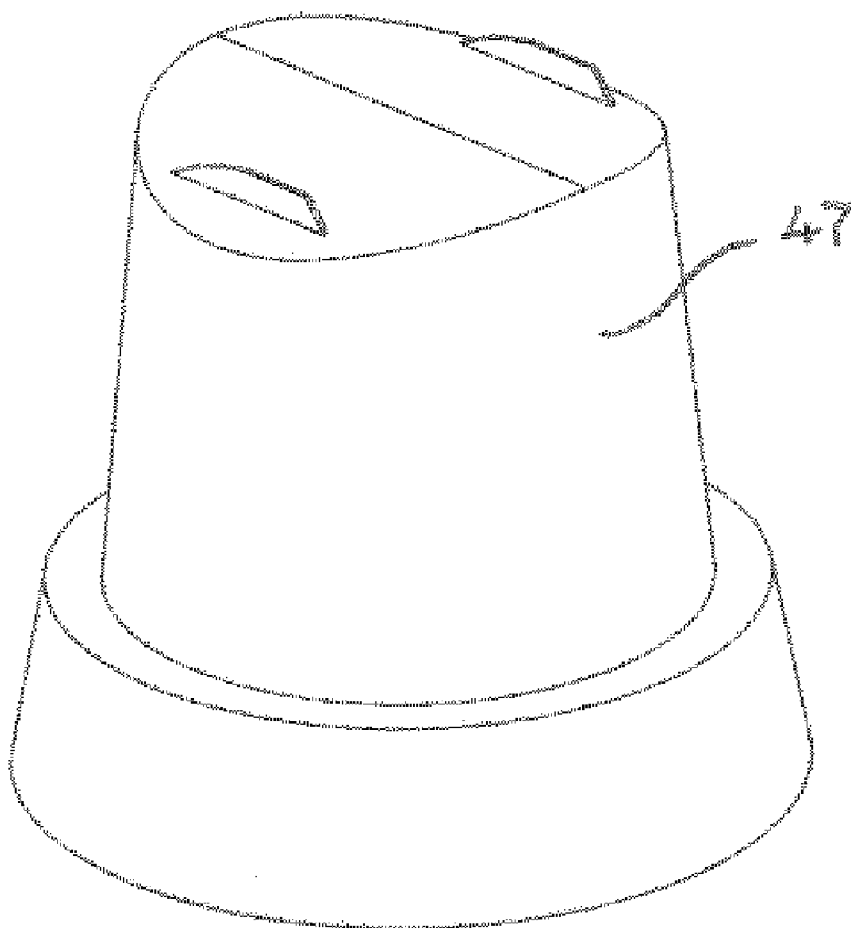


Fig. 20

## WATERCRAFT

### CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This patent application is a continuation-in-part of U.S. patent application Ser. No. 10/856,092 filed on May 28, 2004, and claims priority to PCT/AU02/01621 filed on Nov. 29, 2002, and Australian patent applications 2004/906848 filed on Dec. 1, 2004, 2002/950110 filed on Jul. 11, 2002, 2002/950047 filed on Jul. 9, 2002, and PR 9188 filed on Nov. 29, 2001, which are incorporated herein by reference.

### FIELD OF THE INVENTION

[0002] The present invention generally relates to a watercraft. In particular the present invention relates to a watercraft capable of supporting a person on top of the craft and having a propulsion system to assist in propelling the vessel.

### BACKGROUND

[0003] Typically, kayaks are of the conventional sit-in kayak construction wherein the operator sits in an enclosed cockpit within the shell of the kayak, entering through an opening in the upper deck of the kayak. Modifications on this type of kayak have the additional features of water jet propulsion.

[0004] With the increasing popularity in recreational water activities the sit-on-top kayak has become increasingly popular due to its stability and ease of use. Sit-on-top kayaks, which include surf-skis and wave-skis, have become very popular for those people who do not enjoy being confined in a traditional kayak, preferring a floating platform that gives the operator easy access to board the craft, particularly after the craft has capsized, and relative ease to disembark from the vessel.

[0005] Typically, a sit-on-top kayak is characterised by a watertight shell having an upper and lower skin, and an open cockpit area with seating and footrests molded or provided on the upper skin of the shell. Several types of sit-on-top kayaks are much wider across the beam and do not possess the narrow bow and streamlined hull dynamics of the traditional enclosed kayak, resulting in a more stable, user-friendly kayak for all to enjoy. All kayaks typically use a double-ended paddle to power and maneuver the kayak—the greater the force placed on the paddle blade in the water the greater the rate of travel of the kayak.

[0006] As with many kayaks and manually propelled watercraft, the operator will eventually tire due to the physical demands of paddling the craft, this being particularly prevalent with sit-on-top kayaks. This may be overcome by providing a motor to propel the kayak, however, with more stringent environmental regulations being imposed on the use of powered watercraft, such as jet skis, an alternative having a reduced environmental impact is needed for recreational activities particularly at waterside resorts.

[0007] The preceding discussion of the background to the invention is intended only to facilitate an understanding of the present invention. It should be appreciated that the discussion is not an acknowledgement or admission that any of the material referred to was part of the common general knowledge as of the priority date of the application.

[0008] It is an aspect of this invention to provide a sit-on-top kayak having a propulsion system, enabling an operator to enjoy propulsion assistance if and when required.

### SUMMARY

[0009] The present invention provides a watercraft in the form of a sit on top kayak including: a shell having a longitudinal extent, the shell comprising an upper skin adapted to support at least one person; a lower skin defining a hull for contact with the water, the hull having a shallow draft so as to have minimal impact on the marine environment; a cavity between the upper and lower skin; and an aperture which removably secures a propulsion system for propelling the kayak, the propulsion system being configured to cooperate with the kayak to maintain the shallow draft, the aperture extends through the upper and lower skin and is defined by a sidewall enclosure between the lower skin and the upper skin to maintain the integrity of the shell and ensure the cavity remains watertight, whereby the watercraft can be propelled by the person using a conventional paddling motion regardless of whether the propulsion system has been fitted.

[0010] The need exists for a sit-on-top kayak designed to support one or more occupants and adapted to accommodate a removable propulsion system such that, when the propulsion system is removed the watercraft is capable of practical functioning. The kayak should also provide recreational enjoyment without any detriment to the environment in the form of noise, bank-wash erosion or pollution, whilst greatly reducing the chance of injuries to other people.

[0011] The aperture may be in the aft portion of the watercraft, adjacent the most rearward point of the stern, such that, when fitted the propulsion system is aft of the rear most operators position.

[0012] The propulsion system may be easily removed from the watercraft to facilitate ease of handling when loading and unloading the watercraft from storage and ease of handling at the waters edge. The propulsion system may have an intake for receiving water and an outlet for discharging water.

[0013] The propulsion system may be positioned relative to the watercraft to ensure the intake of the propulsion system has a continuous supply of water. The aperture may be configured to provide easy positioning and securing of the propulsion system. When the propulsion system is in place, a lower end of the propulsion system may be substantially flush with an under-side of the hull, therefore reducing the impact on the environment, particularly when passing across coral outcrops, weed banks and riverbanks.

[0014] The propulsion system may comprise a pump and a motor to drive the pump. The motor may be powered by a fuel source such as a battery system, solar power, fuel cell, or photovoltaic cells. The fuel source may be one or more batteries. The motor may be an electric motor that may be mounted transverse to the longitudinal axis of the kayak.

[0015] In one aspect, the pump and motor are integral. The pump may be an impeller type pump or a centrifugal pump.

[0016] In another aspect, a coupler may separate the pump from the electric motor. The coupler may be, for example, a belt drive.

[0017] A shroud may be fitted over the propulsion system. The shroud may be fitted to the pump to direct the water discharged into a central rearward position, substantially aligned with the longitudinal axis of the watercraft.

[0018] The inlet of the propulsion system is provided by an inlet of the pump through which the water is drawn and the outlet of the propulsion system is defined by an outlet of the pump through which water is discharged. The inlet and outlet may be protruding below or substantially flush with the under side of the hull. The water drawn and discharged from the propulsion system may be drawn and discharged substantially below the surface of the water. The water discharged from the propulsion system may be propelled rearward, substantially parallel to the longitudinal axis of the watercraft.

[0019] The watercraft may be fitted with an activation device to activate and deactivate the propulsion system when required.

[0020] The propulsion system fitted to the watercraft may be driven by a DC electric motor, which in turn is provided with a compact power source in the form of one or more on-board batteries. The source of power may come from a rechargeable storage battery or any other method of producing electrical energy such as photovoltaic cells or fuel cell technology, etc. The further environmental advantage of such an electrical driven motorized watercraft is that the pollution emission levels are negligible. This clean, eco friendly form of propulsion is not intended to be of high speed but more inclined to appeal to the general populous of people enjoying the usage at beach side resorts, coral outcrops, ocean adventure tours, inland lakes and harbors, eco wilderness tours and general leisure activities.

[0021] The propulsion system may be positioned in a holding compartment integral with the upper skin and protected from the elements by way of a hood, lid or hatch cover. The fuel source may be positioned in a holding compartment integral with the upper skin and protected from the elements by way of a hood, lid or hatch cover.

[0022] The watercraft may be fitted with a steering mechanism for steering the watercraft when being propelled by the propulsion system. As one feature, the steering mechanism may direct the body of water discharged from the propulsion system.

[0023] In one aspect, the steering mechanism is provided by the shroud. The shroud may be rotatable in the horizontal plane, allowing angular redirection of the water discharged to facilitate turning of the watercraft. In another aspect, the steering mechanism includes an aft fitted rudder arrangement.

[0024] The hull may have a profile consisting of at least one keel or stepped hull formation. The keel or stepped hull formation may run from the stern of the kayak towards the bow.

[0025] The hull may have a recessed portion centrally located along the longitudinal axis, and at the stern of the kayak, wherein the recessed portion induces and helps maintain the flow of water to the propulsion system, whilst reducing the drag upon the watercraft. The recessed portion may be in the form of a channel.

[0026] The keel or stepped hull formation may be designed to extend deeper into the water than the propulsion system. This will provide protection to the propulsion system from underwater contact particularly in shallow depths, without impeding the flow of water towards the propulsion system.

[0027] At least one flotation assembly may be located in an aft position of the shell. The flotation assembly may be removable. There may be two flotation assemblies. Each flotation assembly may include an adjustable element such that each assembly is variably adjusted between an extended position and a retracted position. Each flotation assembly may be releasably mounted with respect to the watercraft and comprises at least one support pontoon attached to a support arm. The support arm may define the adjustable element.

[0028] Each flotation assembly may be located on opposed sides of the longitudinal axis of the watercraft, and being symmetrical with respect to each other about said axis. When fitted to the watercraft the flotation assemblies assist in transferring any unstable rolling action of the watercraft back to the semi submersed pontoons to increase the stability of the overall watercraft. The pontoons may provide an additional buoyancy effect on the watercraft to provide some compensation for the weight of the propulsion system. The additional buoyancy effect of the flotation assemblies may be equal to the weight of the propulsion system.

[0029] The kayak may incorporate at least one storage compartment. The storage compartment may be integral with the upper skin.

[0030] In another aspect, the propulsion system is provided by a screw propeller and motor. A cage may surround the propeller to protect the environment and other swimmers. The cage may be integral with the propulsion system or it may be removably attached to the lower skin of the shell.

[0031] The screw propeller may have a diameter that will allow for the overall draft depth of the watercraft to be minimal so as to avoid underwater obstacles whilst giving consideration to properties of propeller efficiency. The motor may be an electric drive or electric motor that may be fully immersed.

[0032] In a further aspect, the propulsion system is provided by a paddle wheel and motor. The paddle wheel may be positioned within the aft section such that the outer most extremity of the paddle wheel is adjacent the most rearward point of the stem, providing a forward thrust to the watercraft. The electric motor may be integral with or positioned within the inner perimeter of the rotating paddle wheel so as the unit acts as one in respect of mounting and dismounting from the watercraft.

[0033] The paddle wheel may be provided with rotational torque capabilities from the electric motor mounted with its axis parallel to the rotational axis of the paddle wheel. The electric motor may be attached to the paddle wheel by a coupler, such as, for example, a belt drive.

[0034] A cage may encapsulate the under water portion of the paddle wheel for the protection of the environment and swimmers. The cage may be removably attached to the underside of the hull or be integral with the propulsion

system. A cage may surround the exposed portion of the paddle wheel. The cage also provides protection for the motor from the elements.

[0035] The upper skin may also provide footrests and a seat for each person. The seat may have a support surface raised slightly above the portion of cockpit flooring immediately forward of the seat so as to keep the person above the lowest point any water may collect.

[0036] Apertures may be provided in the shell. The apertures may be capable of accepting posts to aid in the transport of the watercraft across land.

[0037] The watercraft may also incorporate an underwater viewing window for the enjoyment of the occupants. The cockpit floor space may have an opening which may receive a viewing window for viewing underwater objects. The opening may have a raised rim extending around the entire perimeter. The raised rim aids in keeping the top of the viewing glass dry and clean for underwater viewing purposes.

[0038] To maintain a single shell type hull, and for an added safety feature in the event of damage to the transparent window, the window aperture is molded with integral side walls so that the underside hull molding will be integral with the upper hull deck cockpit floor, whereby the aperture receives the window.

[0039] The present invention further provides a watercraft in the form of a sit on top kayak comprising: a shell having an upper skin adapted to support at least one person, a lower skin defining a hull for contact with the water, wherein the shell accommodates a propulsion system for propelling the watercraft, such that the watercraft is configured to maintain a cavity within the shell watertight allowing the person operating the watercraft to propel him/herself in a standard manner when the propulsion system is removed.

[0040] The propulsion system may be removably secured within an aperture in the aft portion of the watercraft, adjacent the most rearward point of the stern. The aperture may extend through the upper and lower skin. The aperture may be defined by a sidewall enclosure between the lower skin and the upper skin to maintain the integrity of the shell.

[0041] The present invention further provides a watercraft in the form of a sit on top kayak comprising: a shell having a longitudinal extent, the shell comprising an upper skin adapted to support at least one person, a lower skin defining a hull for contact with the water, the hull having a shallow draft so as to have minimal impact on the marine environment; a cavity between the upper and lower skin; and an aperture which removably secures a propulsion system for propelling the kayak, the propulsion system being configured to cooperate with the kayak to maintain a shallow draft, the aperture extends through the upper and lower skin and is defined by a sidewall enclosure between the lower skin and the upper skin to maintain the integrity of the shell and ensure the cavity remains watertight, at least one flotation assembly comprising an adjustable element such that the flotation assembly is adjustable between an extended position and a retracted position, allowing the person to increase or decrease the degree of stability added to the shell, whereby the watercraft can be propelled by the person using a conventional paddling motion regardless of whether the

propulsion system is accommodated in the aperture. The flotation assembly provides an increase in buoyancy to the watercraft.

[0042] There may be two flotation assemblies, each being located in an aft position of the shell, and on opposed sides of the longitudinal axis of the watercraft, and being symmetrical with respect to each other about said axis. The assemblies may be located sufficiently aft so as not to interfere with the paddling motion.

[0043] The present invention further provides a watercraft in the form of a sit on top kayak, comprising a shell having an upper and lower skin whereby one or more operators are seated upon an open cockpit area formed as part of the upper skin, the upper skin and lower skin define a cavity, the shell being capable of receiving and supporting at least one flotation assembly aft of the most rearward seating position, the shell having an aperture aft of the most rearward seating position to receive and retain a propulsion system, the aperture extending between the upper and lower skins, separated from the cavity by a sidewall such that no water may pass through the aperture into the cavity, whereby the watercraft is capable of being propelled by the paddling action of one or more of the operators when the propulsion system is removed.

[0044] The present invention still further provides a watercraft in the form of a sit on top kayak comprising a shell having an upper and lower skin which define a cavity, and an aperture within the shell to accommodate a propulsion system, the aperture extending between the upper and lower skins and being separated from the cavity by a sidewall such that no water may pass through the aperture into the cavity, whereby the watercraft is capable of being propelled by the paddling action of an operator supported on the upper skin when the propulsion system is removed.

[0045] The present invention further provides a watercraft in the form of a sit on top kayak comprising a shell having a lower skin defining a hull for contact with the water and an upper skin having a cockpit adapted to support a first occupant and a second occupant whereby the first occupant is in face to face relation with the second occupant, the shell being capable of receiving and supporting at least one flotation assembly aft of the most rearward seating position and able to receive and retain a propulsion system aft of the most rearward seating position, the shell having a cavity between the lower skin and upper skin, and an aperture extending therebetween, the aperture having a sidewall extending between the upper and lower skin such that the cavity remains watertight and allowing the watercraft to be propelled by the paddling action of one or both of the occupants regardless of whether the aperture accommodates the propulsion system.

[0046] The present invention further provides a watercraft in the form of a sit on top kayak comprising: a shell having an upper skin adapted to support a first occupant and a second occupant, whereby the first occupant is in face-to-face relation with the second occupant, and a lower skin defining a hull for contact with the water, a cavity between the upper and lower skin; and an aperture extending through the upper and lower skin and defined by a sidewall enclosure between the lower skin and the upper skin to maintain the integrity of the shell and ensure the cavity remains watertight, wherein the aperture removably secures a propulsion

system for propelling the watercraft, such that a cavity within the shell remains watertight allowing the watercraft to be propelled by the paddling action of one or both of the occupants when the propulsion system is removed.

[0047] The present invention further provides a watercraft in the form of a sit on top kayak comprising: a shell having an upper skin adapted to support a first occupant and a second occupant, whereby the first occupant is in face-to-face relation with the second occupant, and a lower skin defining a hull for contact with the water, a cavity between the upper and lower skin; and an aperture extending through the upper and lower skin and defined by a sidewall enclosure between the lower skin and the upper skin to maintain the integrity of the shell and ensure the cavity remains watertight, at least one flotation assembly comprising an adjustable element such that the flotation assembly is adjustable between an extended position and a retracted position, allowing the person to increase or decrease the degree of stability added to the shell, wherein the aperture removably secures a propulsion system for propelling the watercraft, such that a cavity within the shell remains watertight allowing the watercraft to be propelled by the paddling action of one or both of the occupants when the propulsion system is removed, the flotation assembly providing an increase in buoyancy to the watercraft.

[0048] The present invention further provides a watercraft in the form of a sit on top kayak including: a shell having a longitudinal extent, the shell comprising an upper skin adapted to support at least one person; a lower skin defining a hull for contact with the water, the hull having a profile comprising of at least one keel, a recessed portion at the stern of the kayak and centrally located along the longitudinal extent, wherein the recessed portion induces and helps maintain the flow of water to a propulsion system, whilst reducing the drag upon the watercraft, the keel extending deeper into the water than the propulsion system, to minimise the impact on the marine environment; a cavity between the upper and lower skin; and an aperture which removably secures the propulsion system for propelling the kayak, the propulsion system being configured to cooperate with the kayak to maintain the shallow draft, the aperture extends through the upper and lower skin and is defined by a sidewall enclosure between the lower skin and the upper skin to maintain the integrity of the shell and ensure the cavity remains watertight, whereby the watercraft can be propelled by the person using a conventional paddling motion regardless of whether the propulsion system is accommodated in the aperture.

[0049] The present invention further provides a watercraft configured as a sit on top kayak, including: a shell having a longitudinal extent, the shell comprising an upper skin providing a paddling position; a lower skin defining a hull for contact with the water, a cavity between the upper and lower skin; and an aperture within the shell opening onto the upper and lower skins, the aperture being defined by a wall extending between the lower skin and the upper skin to maintain the integrity of the shell thereby ensuring the cavity remains watertight, a propulsion system adapted to be removably received in the aperture, for interaction with water below the hull to provide propulsion, whereby a person occupying the paddling position can propel the watercraft with a paddling motion regardless of whether the propulsion system is accommodated in the aperture.

[0050] The rotational molded kayak has many features that make the craft very user friendly and functional for the purpose of recreational usage. The upper skin cockpit area may have a shallow sidewall that forms the surround. The backrest may rise to a point higher than any deck portion forward of the most rearward seating position.

[0051] The present invention provides a watercraft comprising: a shell having an upper skin incorporating an aperture therein and adapted to support at least one person; a lower skin defining a hull for contact with the water; and a cavity between the upper and lower skin, the shell having a pocket therein extending from the aperture into the cavity; an insert adapted to be positioned with respect to the aperture such that in one position the insert is in an elevated position so as to provide an elevated platform, and in another position is in an inverted position such that the insert is substantially received in the pocket.

[0052] In the elevated position the inset may provide a seat above the upper skin for the operator, whilst in an inverted position the insert may provide a container such as a bucket. When in an inverted position the insert may be substantially flush with the upper skin and the watercraft may be easily transported and stored.

[0053] The insert may be releasably locked in position relative to the pocket. The insert is cylindrical in shape. The cylinder is closed at one end. The closed end of the cylinder may provide a cushion when the cylinder is in an inverted position.

[0054] The watercraft may also comprise at least one flotation assembly mounted on the shell. The flotation assembly may be removably mounted. The flotation assembly may be in the form of an outrigger.

[0055] The present invention further provides a watercraft comprising: a shell having an upper skin incorporating an aperture therein and adapted to support at least one person; a lower skin defining a hull for contact with the water; and a cavity between the upper and lower skin; a cylinder having at least one end closed and adapted to be positioned with respect to the aperture such that the cylinder is moveable from an elevated position, whereby it provides an elevated platform, or an inverted position.

[0056] In use, when the cylinder is in an elevated position an operator may position himself on the cylinder so as to be seated above the upper skin of the watercraft. When the cylinder is in an inverted position the cylinder can be used as a bucket. In this position the watercraft may also be easily transported or stored.

[0057] The cylinder may be releasably locked with respect to the aperture. The closed end of the cylinder may provide a cushion.

[0058] In one aspect, the aperture extends inwardly from the upper skin terminating a distance from the lower skin and is defined by a bottom surface and a sidewall enclosure between the upper skin and the bottom surface to ensure the cavity remains watertight.

[0059] In another aspect, the aperture extends from the upper skin to the lower skin and is defined by a sidewall enclosure between the lower skin and the upper skin to maintain the integrity of the shell and ensure the cavity remains watertight. The aperture may be adapted to remov-

ably secure a propulsion system for propelling the kayak, the propulsion system being configured to cooperate with the kayak to maintain the shallow draft.

[0060] The cylinder may be placed in the inverted position when the propulsion system is in place.

[0061] As the watercraft is watertight, it is capable of being propelled by the paddling action of one or more of the operators when the propulsion system is removed.

[0062] The watercraft may also comprise at least one flotation assembly mounted or removably mounted on the shell. The flotation assembly may be in the form of an outrigger.

[0063] The present invention further provides a watercraft comprising: a shell having an upper skin incorporating a securing device therein, and adapted to support at least one person; a lower skin defining a hull for contact with the water; and a cavity between the upper and lower skin; a body adapted to be releasably secured with respect to the securing device of the upper skin, whereby when the body is secured to the securing device the body provides an elevated platform.

[0064] The body may be in the form of a cylinder having at least one end closed. The closed end may provide a seat which may have a cushion attached thereto.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0065] The invention will be better understood by reference to the following description of several specific embodiments thereof as shown in the accompanying drawings in which:

[0066] FIG. 1 is a plan view of the watercraft according to a first embodiment;

[0067] FIG. 2 is a view similar to FIG. 1 showing an aperture;

[0068] FIG. 3 is a perspective sectional view of the stern region of FIG. 2;

[0069] FIG. 3a is a view similar to FIG. 3 with the propulsion system being inserted into the aperture;

[0070] FIG. 3b is a view similar to FIG. 3a with the propulsion system inserted into the aperture;

[0071] FIG. 4 is a perspective sectional view of the underside of the watercraft showing the propulsion system;

[0072] FIG. 5 is a bottom view of FIG. 4;

[0073] FIG. 6 is a plan view of the watercraft according to a second embodiment; and

[0074] FIG. 7 is a side view of FIG. 6;

[0075] FIG. 8 is a perspective view of FIG. 6;

[0076] FIG. 9 is a plan view of the watercraft according to a third embodiment;

[0077] FIG. 10 is a side view of FIG. 9 with two operators;

[0078] FIG. 11 is a plan view of the watercraft according to a fourth embodiment;

[0079] FIG. 12 is a rear view of the watercraft according to the first embodiment;

[0080] FIG. 13 is a rear view of the watercraft according to the second embodiment;

[0081] FIG. 14 is a perspective sectional view of the underside of the watercraft showing the propulsion system according to a fifth embodiment.

[0082] FIG. 15 is a perspective view of a watercraft according to a sixth embodiment showing an insert in an inverted position;

[0083] FIG. 16 is a view similar to FIG. 15 with the insert in an elevated position;

[0084] FIG. 17 is a perspective view of a watercraft according to a seventh embodiment without outriggers and having the insert removed from the watercraft;

[0085] FIG. 18 is a perspective view of a watercraft according to a further embodiment showing an insert in an inverted position;

[0086] FIG. 19 is a view similar to FIG. 18 but from a bottom perspective;

[0087] FIG. 20 is a perspective view of a cylinder according to an embodiment of the invention; and

[0088] FIG. 21 is a schematic illustration of a kayak according to the invention.

#### DETAILED DESCRIPTION

[0089] Referring to FIGS. 1 to 5 and 12, the invention according to the first embodiment is a watercraft in the form of a sit on top kayak 11 comprising an upper skin 13 and a lower skin 15 to define a sealed cavity.

[0090] The upper skin 13 provides a support area in the form of a cockpit 19 to receive an operator 21 (not shown). The lower skin 15 defines a hull 23 which contacts the water when the kayak 11 is in use.

[0091] The kayak 11 has a stern region 25 aft of the cockpit 19. The stern region 25 incorporates an aperture 24 extending from the upper skin 13, through to the lower skin 15, with a side wall 100 extending from the upper skin 13 to the lower skin 15. The aperture 24 is configured to removably retain a propulsion system 31 such that the propulsion system 31 is easily fitted or removed by the operator.

[0092] The kayak 11 is configured such that, upon removal of the propulsion system 31, the kayak 11 can be used in a conventional manner for practical use. The propulsion system 31 comprises a pump 33 and an electric motor 30 to assist in the propulsion of the kayak 11.

[0093] The pump 33 has an intake 49 for receiving water, and an outlet 51 for discharging water, to propel the kayak 11. The outlet 51 is positioned such that the water discharged therefrom is substantially aligned with the longitudinal axis of the kayak 11. The pump also has a shroud 53 located over the outlet 51, and is rotatable in the horizontal plane. The shroud 53 has a nozzle 56 from which discharged water may accelerate from the shroud 53. The shroud 53 may be controlled by the operator to direct the water discharged from the pump in order to assist in maneuvering and steering the kayak 11.

[0094] The propulsion system 31 is positioned such that it does not protrude below the hull 23 adjacent the propulsion system 31. This limits the damage that may be caused by underwater obstacles when the kayak 11 is in use.

[0095] The stern region 25 incorporates a hood 54 which is contoured with the shape of the kayak 11. The hood 54 is located over the propulsion system 31, providing protection from the elements.

[0096] The propulsion system 31 may be activated by an activation device in the form of an on/off switch 55 located near the cockpit 19. The cockpit 19 incorporates footrests 57 molded into the upper skin 13, and a seat 59. The seat 59 is raised above the floor 61 of the cockpit 19 so that the operator 21 does not sit in a pool of water which may splash onto the kayak 11.

[0097] The hull 23 has a profile to induce water towards the pump 33 whilst protecting the pump 33 from any underwater obstacles. For this purpose, the hull 23 incorporates two keels 45 substantially parallel to the longitudinal axis of the kayak 11, and running along the length of the kayak 11, and a recessed portion 47 located in the stern region 25, as best seen in FIG. 4.

[0098] Referring to FIGS. 6 to 8 and 13 the invention according to a second embodiment comprises essentially the same features as the first embodiment with the addition that the kayak 11 incorporates two flotation assemblies 37. Each flotation assembly 37 comprises a pontoon 39 and pontoon arm 41. The pontoon arm 41 is received in a socket in the form of a blind bore, not shown, located in the kayak 11. The pontoon arm 41 is capable of variable adjustment between a retracted and an extended condition, and is adapted to be locked in the selected condition. When the flotation assembly 37 is fitted it is locked into place and provides increased stability and buoyancy to the kayak 11.

[0099] Referring to FIGS. 9 and 10, a third embodiment of the watercraft is shown. This embodiment varies from the embodiment shown in FIGS. 6 to 8 in that it is configured to support two operators 21 in forward facing position.

[0100] Referring to FIG. 11, the invention according to a fourth embodiment is a watercraft in the form of a sit on top kayak 11 comprising an upper skin 13 and a lower skin 15 to define a sealed cavity.

[0101] The upper skin 13 provides a support area, in the form of a cockpit 19, to a first occupant (not shown) and second occupant (not shown). The lower skin 15 defines a hull 23 which contacts the water when the kayak 11 is in use.

[0102] The cockpit 19 has a first seat support 59a and a second seat support 59b. The first seat support 59a provides seated support for the first occupant, the second seat support 59b provides seated support for the second occupant. The first seat support 59a is located aft of the second seat support 59b, and is positioned such that the first occupant has a forward view from the kayak 11. The second seat support 59b is positioned such that the second occupant is seated facing the first occupant.

[0103] Each seat 59a, 59b is raised above the floor 61 of the cockpit 19 so that the occupants do not sit in a pool of water which may result from water splashing into the kayak 11.

[0104] The first occupant operates the kayak, whilst the second occupant is a passenger. The cockpit also provides footrests 57 for the first occupant. The footrests 57 are located in spaced apart relation along each side of the cockpit 19. When the first occupant is seated in the kayak 11 he/she can place a leg adjacent either side of the cockpit 19 and gain support from the footrests 57.

[0105] The cockpit 19 also has a flat surface 24. The flat surface 24 is located forwardly of the first occupant and between the footrests 57. The flat surface 24 provides an area where the second occupant may place his/her legs when seated in the second seat support 59b without interfering with the first occupant. The cockpit also provides a viewing window 26 allowing the occupants to view underwater.

[0106] FIG. 14 shows a third embodiment of the invention wherein the propulsion system 31 comprises a screw propeller 63 which is driven by a submersible electric motor 65. The propeller 63 is of a diameter which minimizes the draft depth of the kayak 11 whilst giving due consideration to propeller efficiency. In order to protect people from the propeller a cage 67 (not shown) is fitted around the propeller 63 to shield the blades.

[0107] The kayak 11 also incorporates compartments, not shown, which enable the operator to store items within.

[0108] In a further embodiment, not shown, the propulsion system 31 is provided by a paddle wheel in combination with an electric motor. The paddle wheel is positioned such that rearmost portion of the wheel does not extend beyond the rearmost stern region 25 of the kayak. Again a cage is used to protect the exposed sections of the paddle wheel in order to prevent injury to a person.

[0109] In this embodiment the electric motor is positioned within the paddle wheel and parallel with the longitudinal axis of the paddle wheel. This enables the propulsion system 31 of this embodiment to be removed easily.

[0110] In use the operator 21 may position the kayak, minus the propulsion system 31 upon the waters edge before retrieving and positioning the propulsion system 31 in the aperture, as indicated in FIGS. 3a and 3b. Whilst paddling, the operator may activate the propulsion system 31 using the on/off switch 55, and allow the propulsion system 31 to propel the kayak 11 or to assist the operator 21 whilst the operator continues to paddle in a conventional manner.

[0111] If the operator wishes to use the kayak 11 without the assistance of the propulsion system 31, the propulsion system 31 need not be fitted and the kayak 11 can still be used in a conventional manner.

[0112] Where the kayak 11 is fitted with two flotation assemblies 37 the operator may adjust and lock them in a position which will give the desired stability required by the operator.

[0113] It is believed that the introduction of this invention will provide recreational enjoyment without any detriment to the environment in the form of noise, bank-wash erosion or pollution, whilst greatly reducing the chance of injuries to other people. The kayak so described by this invention is primarily for recreational use in and around populated holiday beaches and waterways. For reasons of safety and ease of use in recreational areas, the speed range of the craft may be limited to 2-6 knots. At these low speeds, kayakers are

equipped with a hand held paddle for the operator to enjoy the tranquil moments of kayaking without the engagement of the propulsion system. When the operator requires assistance or some relief from paddling, he or she simply engages the electric drive through a simple on/off button or switch.

[0114] Referring to the FIGS. 15 and 16, the invention according to a sixth embodiment is a watercraft in the form of a sit on top kayak 111 comprising a shell 113 having an upper skin 123, a lower skin 124 and a cavity 141. The upper skin 123 has an aperture 143 extending inwardly and terminating a distance from the lower skin 124 to define a pocket 145. The pocket 145 has a sidewall and a bottom surface to ensure the cavity 141 remains watertight.

[0115] The kayak 111 also comprises an insert in the form of a cylinder 147, as shown in FIG. 20. The cylinder 147 is lockable with respect to the aperture 143 in either an inverted position, as shown in FIG. 15, or an elevated position, as shown in FIG. 16. The cylinder 147 is closed at one end, providing a cushion 149 (not shown) at that end.

[0116] In use the cylinder 147 can be positioned in an elevated position to provide an elevated platform for the operator (or passenger). In this position the operator is above the level of the water providing a better platform for activities such as fishing. When the cylinder 147 is not being used as an elevated platform, the cylinder 147 may be positioned in an inverted position and used as a bucket.

[0117] To increase the stability of the kayak 111, the shell may have an outrigger 151 mounted either side thereof in a rearward position.

[0118] FIG. 17 shows a seventh embodiment of the invention without outriggers 151.

[0119] FIG. 18 and 19 shows a further embodiment of the invention with an outrigger 153 connected to the shell 113 in a rearward and forward position. This outrigger 153 provides stability to the shell 113 in one direction due to the buoyancy effect of the outrigger 153, and in the other direction due to the weight of the outrigger 153.

[0120] In this embodiment, the aperture 143 extends through the shell 113 as best shown in FIG. 19. The aperture 143 is adapted to receive a removable propulsion system, not shown, when the cylinder 147 is removed therefrom. Due to the shell 113 being watertight, the kayak 111 can be used with or without the propulsion system or cylinder 147 in place.

[0121] In this embodiment, the cylinder may be positioned with respect to the aperture 143 in an elevated position even when the propulsion system is in position. Furthermore, when the cylinder is in the inverted position with respect to the watercraft the propulsion system may be stored within the cylinder.

[0122] FIG. 21 is a schematic illustration of a kayak according to the invention. The kayak includes a holding or storage compartment 200 integral, by way of connection 202, with an upper skin 204. The upper skin 204 includes hood, lid or hatch cover 205. A rudder 206 is mounted to a lower skin 210 of the kayak by connection 208.

[0123] In the embodiment, a cage 211 is integral with a propulsion system 212 by way of connection 214. The cage

211 surrounds a propellor 215 of the kayak and is removably attached to the lower skin by way of a connection 216.

[0124] The holding compartment 200 includes a motor with mounting 218 and an impeller type pump 220. A fuel source 222 is connected to the motor 218 and is positioned in the holding compartment 200. A coupler such as a belt drive 224 couples pump and motor with mounting 218.

[0125] Modifications and variations such as would be apparent to the skilled addressee are considered to fall within the scope of the present invention. Throughout the specification, unless the context requires otherwise, the word "comprise" or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

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76. A watercraft in the form of a sit on top kayak comprising:

a shell having an upper skin adapted to support at least one person, a lower skin defining a hull for contact with the water, and

an aperture extending through the upper and lower skin at the stern of the kayak and defined by a sidewall enclosure between the lower skin and the upper skin to maintain the integrity of the shell and for releasably receiving a propulsion means, which assists in propelling the watercraft;

the hull having a profile including a hollowed portion to induce and assist in maintaining the flow of water to a propulsion means, wherein the watercraft can be propelled by the at least one person using a conventional paddling motion regardless of whether the propulsion means is accommodated in the aperture.

77. A watercraft according to claim 76 wherein the hollowed portion is in the form of a recessed portion and extends from the stern of the kayak towards the bow of the kayak.

78. A watercraft according to claim 76 wherein an outlet of the propulsion mean comprises a nozzle for discharging a jet of water to propel the kayak, when the propulsion means is located in the aperture.

79. A watercraft according to claim 76 such that when the propulsion means is in place, a lower end of the propulsion means is substantially flush with an under-side of the hull.

80. A watercraft according to claim 76 further comprising a cylinder having at least one end closed and adapted to be positioned with respect to the aperture such that the cylinder provides an elevated platform when in position.

81. A watercraft in the form of a sit on top kayak including:

a shell having a longitudinal extent, the shell comprising

an upper skin adapted to support at least one person,

a lower skin defining a hull for contact with the water, the hull having a profile including a recessed portion at the stern of the kayak and centrally located along the longitudinal extent, wherein the recessed portion induces and helps maintain the flow of water to a propulsion means, whilst reducing the drag upon the watercraft and protecting the propulsion means, the propulsion means assisting to propel the kayak and

an aperture in which the propulsion means is removably secured, the aperture extending through the upper and lower skin and being defined by a sidewall enclosure between the lower skin and the upper skin to maintain the integrity of the shell and ensure that the shell remains watertight,

wherein the watercraft can be propelled by the at least one person using a conventional paddling motion regardless of whether the propulsion means is accommodated in the aperture.

82. A watercraft according to claim 81 wherein the profile of the hull further comprises at least one keel wherein the at least one keel extends deeper into the water than the propulsion means so as to assist with limiting adverse impacts associated with the propulsion means on the marine environment.

83. A watercraft according to claim 81 wherein the hull has a shallow draft so as to limit impact on the marine environment and the propulsion means is configured to cooperate with the kayak to maintain the shallow draft.

84. A watercraft according to claim 81 wherein the aperture is in the aft portion of the watercraft, adjacent the most rearward point of the stem, such that, when fitted, the propulsion means is aft of the rearmost operators position.

85. A watercraft according to claim 81 wherein the propulsion means comprises a pump coupled to a motor to drive the pump.

86. A watercraft according to claim 81 wherein a shroud is fitted over the propulsion means, to direct the water discharged into a central rearward position, substantially aligned with the longitudinal axis of the watercraft.

87. A watercraft according to claim 81 wherein an inlet of the propulsion means is provided by an inlet of the pump through which water is drawn and an outlet of the propulsion means is defined by an outlet of the pump through which the water is discharged, the inlet and outlet protruding below or being substantially flush with the under side of the hull, such that the water drawn and discharged from the propulsion means is drawn and discharged substantially below the surface of the water.

88. A watercraft according to claim 81 wherein the watercraft is fitted with a steering means for steering the watercraft when being propelled by the propulsion means.

89. A watercraft according to claim 88 wherein the steering means comprises a moveable shroud for directing the water discharged from the propulsion means, allowing angular redirection of the discharged water to facilitate turning of the watercraft.

90. A watercraft according to claim 81 wherein the recessed portion is in the form of a channel.

**91.** A watercraft according to claim 81 wherein at least one flotation assembly is releasably mounted with respect to the watercraft.

**92.** A watercraft according to claim 91 wherein the at least one flotation assembly comprises at least one support pontoon attached to a support arm wherein the support arm defines an adjustable element, which allows the assembly to be variably adjusted between an extended position and a retracted position.

**93.** A watercraft according to claim 91 wherein the at least one flotation assembly is located so as not to interfere with the paddling motion.

**94.** A watercraft according to claim 81 wherein the watercraft incorporates at least one storage compartment integral with the upper skin.

**95.** A watercraft comprising:

a shell having an upper skin incorporating an aperture therein and adapted to support at least one person; a lower skin defining a hull for contact with the water; and a cavity between the upper and lower skin, the shell having a pocket therein extending from the aperture into the cavity;

an insert adapted to be positioned with respect to the aperture such that in one position the insert is in an elevated position so as to provide an elevated platform, and in another position is in an inverted position such that the insert is substantially received in the pocket.

**96.** The watercraft according to claim 95 wherein the insert is releasably lockable in position relative to the pocket.

**97.** The watercraft according to claim 95 wherein the insert is cylindrical in shape.

**98.** The watercraft according to claim 97 wherein when in the inverted position the insert is substantially flush with the upper skin.

**99.** The watercraft according to claim 97 wherein when in the inverted position a first end of the insert extends above the upper skin.

**100.** The watercraft according to claim 99 wherein the first end of the cylinder is closed, such as by a removable cover.

**101.** The watercraft according to claim 100 wherein the first end provides a seat for the operator.

**102.** The watercraft according to claim 100 wherein a second end of the insert has molded protrusions extending therefrom, assisting with the tracking of the watercraft and enabling the insert to be supported by the second end when placed on a surface.

**103.** The watercraft according to claim 95 wherein a second end of the cylinder provides a seat when the insert is in the elevated position.

**104.** The watercraft according to claim 95 further comprising at least one flotation assembly mounted on the shell.

**105.** A watercraft comprising:

a shell having an upper skin incorporating an aperture therein and adapted to support at least one person; a lower skin defining a hull for contact with the water; and a cavity between the upper and lower skin; and

a cylinder having at least one end closed and adapted to be positioned with respect to the aperture such that the cylinder is positionable to provide an elevated platform.

**106.** The watercraft according to claim 105 wherein the cylinder is releasably locked with respect to the aperture.

**107.** The watercraft according to claim 105 wherein the aperture extends inwardly from the upper skin terminating a distance from the lower skin and is defined by a bottom surface and a sidewall enclosure between the upper skin and the bottom surface to ensure the cavity remains watertight.

**108.** The watercraft according to claim 105 wherein the aperture extends from the upper skin through to the lower skin and is defined by a sidewall enclosure between the lower skin and the upper skin to maintain the integrity of the shell and ensure the cavity remains watertight.

**109.** The watercraft according to claim 108 wherein the aperture is adapted to removably secure a propulsion means for propelling the kayak, the propulsion means being configured to cooperate with the watercraft to maintain the shallow draft.

**110.** The watercraft according to claim 109 wherein the cylinder can be placed in an elevated position when the propulsion means is in place.

**111.** The watercraft according to claim 105 wherein the cylinder can be placed in an inverted position, whereby a first end of the cylinder is raised above the upper skin.

**112.** The watercraft according to claim 111 wherein the first end of the cylinder is adapted to be closed, such as by a removable cover, to provide an elevated seat for the operator.

**113.** The watercraft according to claim 105 wherein a second end of the cylinder is closed by a bottom wall having a surface contoured to mirror the profile of the hull such that when the cylinder is positioned in the inverted position the bottom wall and hull align to provide a substantially continuous surface.

**114.** The watercraft according to claim 113 wherein the second end of the cylinder has molded protrusions extending therefrom, assisting with the tracking of the watercraft and enabling the cylinder to be supported by the second end when placed on a surface.

**115.** The watercraft according to claim 105 further comprising at least one flotation assembly mounted on the shell.

**116.** A watercraft comprising:

a shell having an upper skin incorporating a securing means therein, and adapted to support at least one person; a lower skin defining a hull for contact with the water; and a cavity between the upper and lower skin; and

a body adapted to be releasably secured with respect to the securing means of the upper skin, whereby when the body is secured to the securing means the body provides an elevated platform.

**117.** The watercraft according to claim 116 wherein the body is in the form of a cylinder having at least one end closed, the at least one end providing a seat when the body is secured to the securing means.