A catamaran has a pair of spaced-apart pontoons, each having a forward tapered end and a rearward end. An underwing is affixed to the pontoons and spans therebetween. The underwing has a forward end and a rearward end. A platform is pivotally connected to the underwing forward end and/or rearward end and conforms to the pontoons at their forward tapered end or their rearward end, respectively. The platform also has a forward end. A power assembly (e.g., oil hydraulic, air hydraulic, cable lift, chain lift, spring loaded, gear-driven, and other lifting mechanisms) is connected to the platform for one or more of lowering or raising the platform from a stowed position to a plurality of working positions—including positions below the waterline—of the catamaran and for one or more of raising or lowering the platform back to the stowed position.
CATAMARAN WITH HINGED UNDERWING

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] None

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH

[0002] Not applicable.

BACKGROUND OF THE INVENTION

[0003] The present invention generally relates to watercraft and more particularly to a catamaran with a forward hinged underwing or bridgework lowerable at sea to insert or extract person(s), article(s), and/or equipment, into or from the water, or onto or from the land, or onto or from rock piles, rock jetties, break walls; insert or extract submarines into or from the water; assist in the efforts of homeland security, military, police and law enforcement, fire-fighting, rescue, and like operations; assist in high speed rescue excursions, including under-fire personnel recovery; assist in turbulent and turbid water rescue, including rescue and recovery from water around dams and waterfalls; assist in aircraft and aircraft personnel recovery; assist in the interdiction of illegal watercraft (smugglers, etc.) and their personnel, contrabands, materials, etc.; assist in buoy and wall servicing at the proper height; and/or provide for the roll on and roll off capabilities of wheelchairs, carts with wheel(s), and specially designed gurneys for rescue operations.

[0004] The superior nautical qualities of catamaran type watercraft are well known. Their high beam-to-length ratio and their shallow draft provide desirable stability and resistance to capsizing. In addition, some specialized catamarans offer high speed, extremely smooth ride, enhanced stability, and greater maneuverability due to their hull shape and propulsion location. This combination of improved speed, stability, ride, and maneuverability provides a unique solution to many age-old problems with the current technologies of landing craft (i.e., landing craft are very slow, unstable in comparison, difficult to maneuver, and are wet as a transport platform). Such superior nautical qualities make catamaran watercraft ideally suited for a variety of inland waterway, lake, close to shore, and open ocean tasks. Such tasks include, inter alia, those listed above. For present purposes, “at sea” means any body of water upon which the inventive catamaran can operate, including, inter alia, inland waterway, lake, ocean, sea, or like body of water.

[0005] One drawback against other vessel types relates to the superior ability of the catamaran’s skipper or crewman to easily accomplish the enumerated tasks. Heretofore, U.S. Pat. No. 5,173,182 proposes an environmental work vessel having a catamaran hull and a pivotally mounted debris scoop mounted between the pontoons. U.S. Pat. No. 3,815,541 proposes a pontoon houseboat having capacity to receive and retain a small craft between the pontoons. In FIGS. 22 and 23, a hinged platform that lowers into the water is disclosed. U.S. Pat. No. 4,020,777 proposes catamaran having a hinged platform between the two pontoons that lowers for retrieving buoys from the water. U.S. Pat. No. 4,545,315 proposes a remote control catamaran type craft with a hinged platform disposed between the pontoons, which platform lowers to retrieve fowl from the water during hunting trips.

[0006] Despite such prior proposals, there still exists a need in the art to modify a catamaran or pontoon-type watercraft so that it can easily perform the tasks listed above. It is to such need that the present invention is addressed.

BRIEF SUMMARY OF THE INVENTION

[0007] A catamaran has a pair of spaced-apart pontoons, each having a forward tapered end and a rearward end. An underwing is affixed to the pontoons and spans therebetween. The underwing has a forward end and a rearward end. A platform is pivotally connected to the underwing forward end and/or rearward end and conforms to the pontoons at their forward tapered end or their rearward end, respectively. The platform also has a forward end. A power assembly (e.g., oil hydraulic, air hydraulic, cable lift, chain lift, spring loaded, gear-driven, and other lifting mechanisms) is connected to the platform for one or more of lowering or raising the platform from a stowed position to a plurality of working positions—including positions below the waterline—of the catamaran and for one or more of raising or lowering the platform back to the stowed position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] For a fuller understanding of the nature and advantages of the present invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

[0009] FIG. 1 is a side elevational view of the catamaran floating in a body of water;

[0010] FIG. 2 is an overhead view of the catamaran of FIG. 1;

[0011] FIG. 3 is a side-elevational view of the catamaran of FIG. 1 with the forward portion of the underwing lowered into the water, for example, to insert or extract person(s), article(s), or equipment into or from the water; or to roll down a retrieval gurney for an unconscious or otherwise disabled person.

[0012] FIG. 4 is an overhead view of the catamaran of FIG. 3;

[0013] FIG. 5 is a sectional view taken along line 5-5 of FIG. 2;

[0014] FIG. 6 is an exploded view of a typical hinge assembly shown in FIG. 5—other rotational systems also are applicable;

[0015] FIG. 7 is a sectional view taken along line 7-7 of FIG. 2;

[0016] FIG. 8 is a side elevational view like that in FIG. 3 with a crewmember of the catamaran standing on the lowered forward underwing for retrieving a person floating in the water;

[0017] FIG. 9 is a side elevational view like that in FIG. 3 with the forward hinged underwing resting upon the beach;
FIGS. 10-12 are side elevational views like those in FIGS. 8 and 9 with the adjustable platform or ramp at different appropriate heights for different missions; and

FIG. 15 is an overhead view like that in FIG. 2 with a specially louvered or grated platform and extension for allowing water to pass therethrough.

The drawings will be described in further detail below.

DETAILED DESCRIPTION OF THE INVENTION

As described above, there is a need to be able to insert or extract person(s), article(s), equipment, into or from the water, or onto or from the land, or onto or from rock piles, rock jetty, break walls; insert or extract submarines into or from the water; assist in the efforts of homeland security, military, police and law enforcement, firefighting, rescue, and like operations; assist in high speed rescue excursions, including under-fire personnel recovery; assist in turbulent and turbid water rescue, including rescue and recovery from water around dams and waterfalls; assist in aircraft and aircraft personnel recovery; assist in the interdiction of illegal watercraft (smugglers, etc.) and their personnel, contrabands, materials, etc.; assist in buoy and well servicing at the proper height, provide for the roll on and roll off capabilities of wheelchairs, carts with wheel(s), and specially designed gurneys for rescue operations which actually allow people in the water to be placed onto a gurney that is then rolled onto the deck, that when upon arrival at the shore or dock, can be rolled to the ambulance. Such “tasks” are well within the capability of the inventive catamaran disclosed herein.

At sea, extraction could involve search, rescue, and recovery missions wherein a watercraft has capsized or otherwise is in distress such that people and/or articles are in the water; turbulent and turbid water rescue and recovery in waters around dams and waterfalls; the interdiction of contraband (articles or people) at sea; as well as high speed rescue, including in under-fire conditions. A variety of other situations similarly could require the watercraft to be able to easily extract person(s), article(s), or equipment from the water or to easily insert divers or swimmers into the water.

On land, quickly inserting and extracting personnel could involve littoral warfare, Special Forces that need to be whisked ashore at a moment’s notice, and other conflicts with military implications to fight the ongoing war on terrorism and the battles of the 21st century. It also could involve extracting unwary people who get stranded on rock piles and rock jetty in a rising tide.

With police or law enforcement operations, a notable advantage of this hinged underwing is the ability to provide a work area at the proper height for law enforcement officers while on patrol and while boarding other craft and equipment. During most law enforcement and interdiction operations, the bow of the patrol boat is pointed towards the area of issue, which could be another boat, Jet Ski, buoy servicing, and/or other aids to navigation (e.g., AIDON), etc. Often, a common problem on most law enforcement boats is the fact that the bow is too high for the execution of many desired operations. For boarding of other craft and equipment, the bow is often too high for many small boats and jet skis. This movable bow area provides an excellent working platform for many different applications.

Regardless of the motivation, the watercraft of choice often is a catamaran, because of its superior nautical qualities, such as, for example, beam-to-length ratio and shallow draft, which provides desirable stability and resistance to capsizing. In addition, some specialized catamarans also offer high speed, extremely smooth ride, and enhanced maneuverability due to their hull shape. This combination of improved speed, stability, ride, and maneuverability provides a unique solution to many age-old problems with the current technologies of landing craft (i.e., landing craft are very slow, unstable in comparison, difficult to maneuver, and are wet as a transport platform). The catamaran’s speed would be important in interdiction efforts, homeland security missions, military operations—including littoral warfare—police and law enforcement patrols, firefighting and rescue operations—including high-speed and turbulent water rescue, and other like applications.

Referring initially to FIGS. 1 and 2, a catamaran, 10, is seen floating in a body of water, 12, having a waterline, 14. Body of water 12 can be an ocean, lake, river, inland waterway, or any body of water upon which the catamaran can be run. A crewman, 16, stands before a helm, 18. The catamaran as shown has a pair of optional hatches, 20 and 22, and twin water jet assemblies, 24 and 26, powered by engines not shown. Catamaran 10 could be propelled with water jets, conventional underwater gear with propellers, Inboard/Outboards, or Outboards, and other propulsion systems. A cabin or other enclosure also could be provided for catamaran 10, such as, for example, a small medical facility, aerial operations from the deck, etc. Much of the description focuses on the hinged platform extending from the forward end of the underwing. Such hinged platform, however, also can extend from the rear edge of the underwing, or from both the front and rear edges of the underwing, as those skilled in the art will appreciate.

Catamaran 10 includes a pair of pontoons, 28 and 30, (see also FIG. 7) each have a forward tapered section, 32 and 34, respectively, as is typical in catamaran design. Interconnecting pontoons 28 and 30 is an underwing or bridgewalk, 36. Hatches 20 and 22, crewman 16, and helm 18, all rest atop deck 36. Additional lifesaving gear, anchor, line, and the like, are carried aboard catamaran 10 in conventional fashion, and as needed depending upon its mission, marine regulations, type of water upon which it operates (e.g., salt water or fresh water), and the like. The size of catamaran 10 also fits its mission, marine regulations, type of water upon which it operates, and like factors well known to the skilled seaman.

In order to provide a rescue capability, a platform, 38, is hingedly or pivotally connected to the forward edge of underwing 36. Railings, 40 and 42, extend adjacent to hinged platform 38 for safety. Referring now also to FIGS. 3 and 4, crewman 16 has moved forward to a control, 44, in order to control and operate the catamaran with full visibility of people and equipment in the water and to control the elevation of platform 38. In addition, lights can be installed, night vision equipment, etc., for night or inclement weather extraction and insertion operations. While a variety of mechanisms for raising and lowering platform 38 can be envisioned and utilized (e.g., oil hydraulic, air hydraulic,
cable lift, chain lift, spring loaded, gear-driven, and other lifting mechanisms), a simple line (for example, steel or other suitable cable) and pulley system is illustrated in the drawings. Specifically, a line, 46, surrounds a pulley, 48, and is connected to platform 38 at a connection point, 50, and to a motor assembly, 52, which includes a reel for line 46 to be wound about. The skilled artisan will appreciate that other power sources capable of lowering and raising platform 38 with line 46 can be used, including a hand crank, as is necessary, desirable, or convenient.

[0029] Platform 38 also can retain an extension, 54, at its forward end, which extension can unfold or otherwise extend from platform 38 into and, perhaps, slightly under waterline 14 to aid in the ability of crewman 16 to walk onto extension 54 to insert or extract person(s), article(s), or equipment into or from the water. Platform 38 also will be seen to flare out at its forward end to follow the contour of forward tapered sections 32 and 34. Such shape results in a larger working area for platform 38 which can be especially useful when platform 38 is lowered into a working or rescue position.

[0030] Referring now to FIGS. 5, 6, and 7, platform 38 will be seen in an upward or stowed position and in phantom in a lowered position, such as for extracting person(s), article(s), or equipment from the water, or inserting divers or swimmers into the water. A portion of platform 38 and extension 54 are slightly under waterline 14 in FIG. 5, although this is not necessary. While a variety of hinge systems can be envisioned, a simple hinge system is shown in FIG. 6. Specifically, a hinge assembly, 56, pivotally connects underwing 36 to platform 38. Extension 54 also is folded back onto platform 38 in a stowed position. Extension 54 also desirably is hingedly connected to platform 38 and is capable of being unfolded by crewman 16 to an operating condition.

[0031] FIG. 8 illustrates novel catamaran 10 rescuing a person, 58, from the water. Specifically, platform 38 has been lowered, extension 54 unfolded, and crewman 16 has walked down onto extension 54 to reach person 58. The ability of platform 38 and especially extension 54 to reach below waterline 14 enables crewman 16 to more easily reach person 58. Such design may even permit a single crewman to affect a rescue at sea.

[0032] FIG. 9 illustrates another anticipated use for novel catamaran 10. Crewman 16 has driven catamaran 10 to a beach, 60, which can be directly accessed with lowered platform 38. Extension 54 still is in its folded and stowed position, but may be extended, if needed. Regardless, the design of pivoting platform 38 enables catamaran 10 to land crewman 16 onto shore 60 for extracting person(s), article(s), or equipment, or to unload people or cargo, or for any other use desired.

[0033] FIGS. 10 through 14 depict crewman 16 standing at various elevations on adjustable platform extension 54 at appropriate heights and level for standing for a specific mission. Also note FIG. 12 where extension 54 is elevated at 90 degrees to the horizon for providing a stop for approaching boats and protection for crewman 16.

[0034] FIG. 15 shows a specially designed platform 62 and extension 64 with special louvered holes (apertures) allowing water passing through without adversely affecting the maneuverability of catamaran 10. This provides for slow operation with the underwing 38 fully lowered and the boat in forward motion. Platform 62 and extension 64 are variants of platform 38 and extension 54. Platform 62 and extension 64 are of grated construction to allow passage of water through its structure while the vessel is in motion, consequently expanding its abilities and uses beyond that of platform 38. Examples of platform 62 and extension 64’s abilities over that of platform 38 and extension 54 would be insertion or extraction of people, article(s), or equipment onto or from rock piles, rock jetties, and break walls; as well as turbulent or turbid rescue and recovery missions, including those around dams and waterfalls. What makes platform 62 able to do this and not platform 38 is because the grated construction allows water to pass through rather than over and into the boat; this “passing through of water” prevents flooding and submergence of the boat into turbulent waters; it also affects handling and maneuverability.

[0035] Another example of platform 62 and extension 64’s unique abilities over platform 38 and extension 54 is high speed rescue, including in under-fire conditions; the high speed is achieved because of reduced water drag and water flow over the platform 62 and extension 64 compared with platform 38 and extension 54. Of course, other construction of platforms 38/62 and extensions 54/64 are possible, as those skilled in the art will appreciate.

[0036] While the invention has been described with reference to a preferred embodiment, those skilled in the art will understand that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the invention. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from the essential scope thereof. Therefore, it is intended that the invention not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this invention, but that the invention will include all embodiments falling within the scope of the appended claims. Also, all citations referred herein are expressly incorporated herein by reference.

1. A catamaran, which comprises:
   (a) a pair of spaced-apart pontoons, each having a forward tapered end and a rearward end;
   (b) an underwing affixed to said pontoons and spanning therebetween, said underwing having a forward end and a rearward end;
   (c) a platform pivotally connected to one or more of said underwing forward end or said underwing rearward end, and conforming to the pontoons at their forward tapered end or rearward end, respectively, said platform having a forward end; and
   (d) a power assembly connected to said platform for one or more of lowering or raising said platform from a stowed position to a plurality of working positions and for one or more of raising or lowering said platform back to said stowed position.
2. The catamaran of claim 1, wherein said platform carries an extension movable from a stowed position to an extended position.
3. The catamaran of claim 2, wherein said extension is pivotally connected to said platform forward end.
4. The catamaran of claim 2, wherein said extension is under water when extended and said platform lowered.

5. The catamaran of claim 1, wherein said platform carries railings.

6. The catamaran of claim 2, wherein one or more of said platform or said extension is louvered.

7. The catamaran of claim 3, wherein said extension is movable to a position about 90° from the horizontal and adjustable to keep level for a crew to stand on.

8. The catamaran of claim 3, wherein said platform is pivotally connected to said underwing forward end.

9. A method for one or more of insertion or extraction of one or more of people, articles, or equipment at sea, which comprises:

(a) providing a catamaran, which comprises:

(i) a pair of spaced-apart pontoons, each having a forward tapered end and a rearward end;

(ii) an underwing affixed to said pontoons and spanning therebetween, said underwing having a forward end and a rearward end;

(iii) a platform pivotally connected to one or more of said underwing forward end or said underwing rearward end, and conforming to the pontoons at their forward tapered end or rearward end, respectively, said platform having a forward end; and

(iv) a power assembly connected to said platform for one or more of lowering or raising said platform from a stowed position to a plurality of working positions and for one or more of raising or lowering said platform back to said stowed position;

(b) one or more of lowering or raising said platform to a position adjacent to said one or more people, articles, or equipment; and

(c) a crewperson accessing said platform to accomplish said one or more of insertion or extraction.

10. The method of claim 9, wherein said platform carries an extension movable from a stowed position to an extended position and said extension is moved into an operable position to aid in said accessing said one or more of insertion or extraction.

11. The method of claim 9, wherein said one or more of insertion or extraction of one or more of people, articles, or equipment at sea, comprises one or more of into or from the water, or onto or from the land, or onto or from rock piles, rock jetties, or break walls; insertion or extraction of submarines into or from the water; assisting in the efforts of homeland security, military, police and law enforcement, fire-fighting, or rescue operations; assist in high speed rescue excursions or under-fire personnel recovery; assist in turbulent and turbid water rescue; assist in aircraft and aircraft personnel recovery; assist in the interdiction of illegal watercraft and their personnel, contraband, or materials; assist in buoy and wall servicing at the proper height; provide for the roll on and roll off capabilities of wheelchairs, carts with wheels, and rescue operation designed gurneys.

12. The method of claim 10, wherein said extension is pivotally connected to said platform forward end.

13. The method of claim 10, wherein said extension is under water when extended and said platform lowered.

14. The method of claim 10, wherein one or more of said platform or said extension is louvered.

15. The method of claim 12, wherein said extension is movable to a position about 90° from the horizontal and adjustable to keep level for the crew to stand on.

16. The method of claim 9, wherein platform is pivotally connected to said underwing forward end.