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Spitzack

(54) **WATER VESSEL STABILIZATION APPARATUS**

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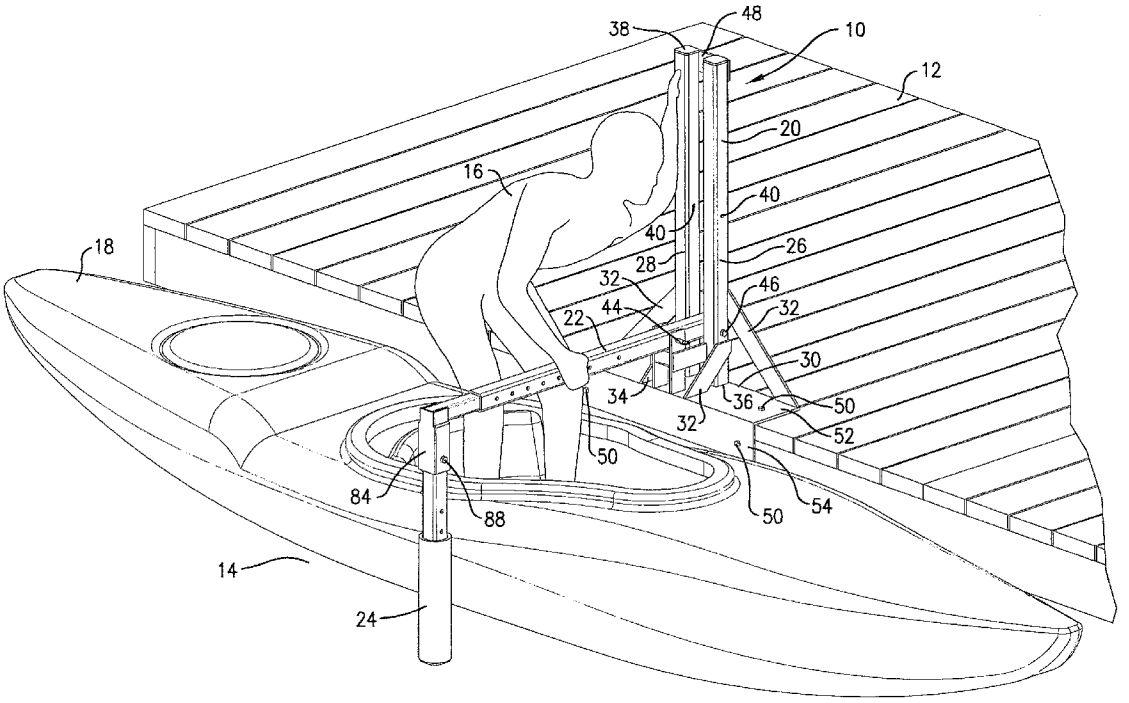
(57) **ABSTRACT**

An apparatus attachable to a docking structure and configured for getting into and out of a small water vessel. The apparatus may comprise a support structure, a handrail, and a vessel retaining arm. The support structure may comprise a support rail fixed via a base to the dock. The handrail may be pivotally attached to the support structure such that in an unfolded configuration, the handrail extends perpendicular to the support rail, and in a folded configuration, the handrail is substantially parallel to the support rail. The vessel retaining arm may be attached to and freely pivot relative to a distal end of the handrail. In the unfolded configuration, the handrail may extend over the water vessel, allowing a user to grasp the horizontal and/or support structures while getting into and out of the water vessel.



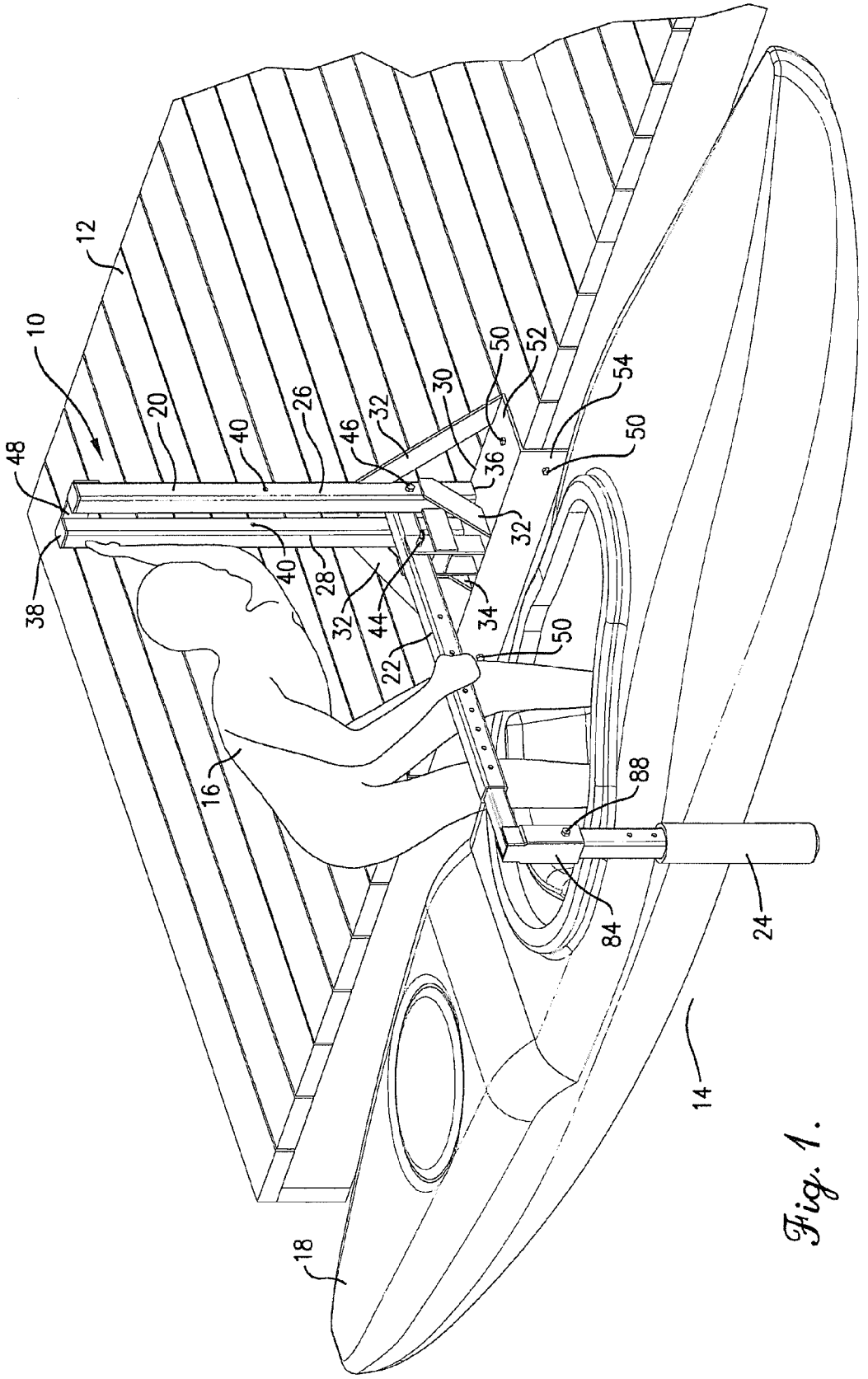


Fig. 1.

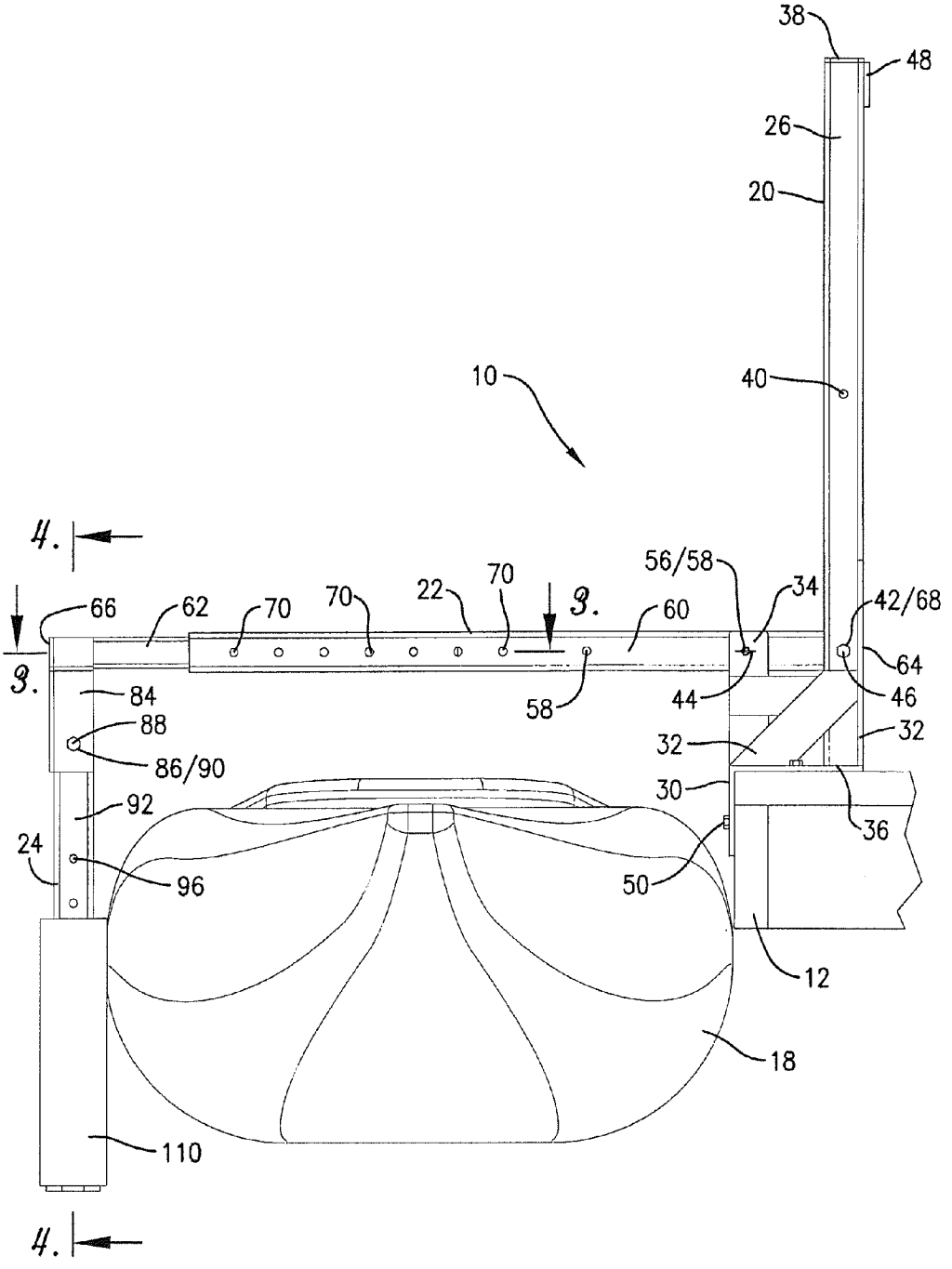

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Fig. 2.

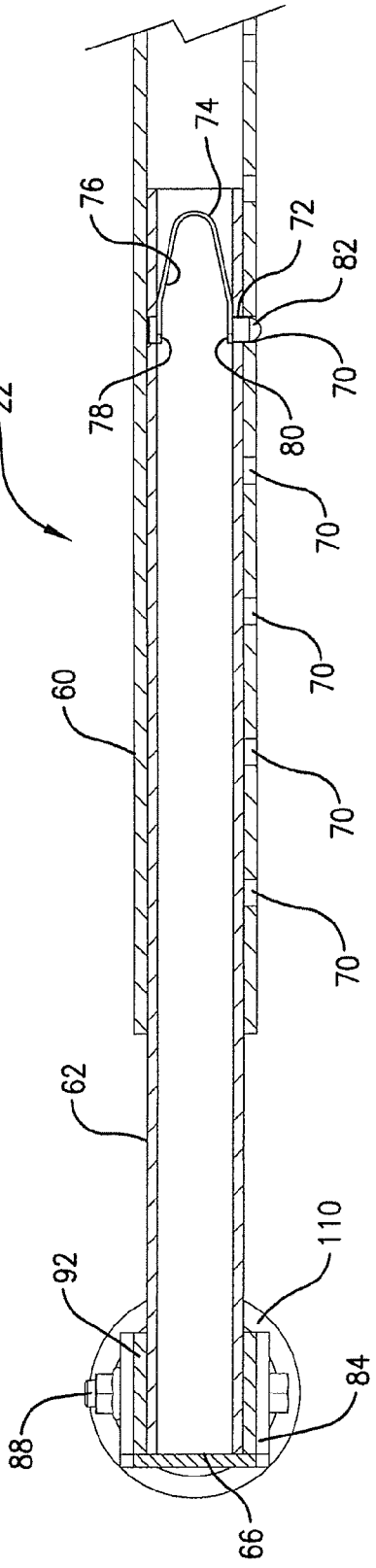

Fig. 3.

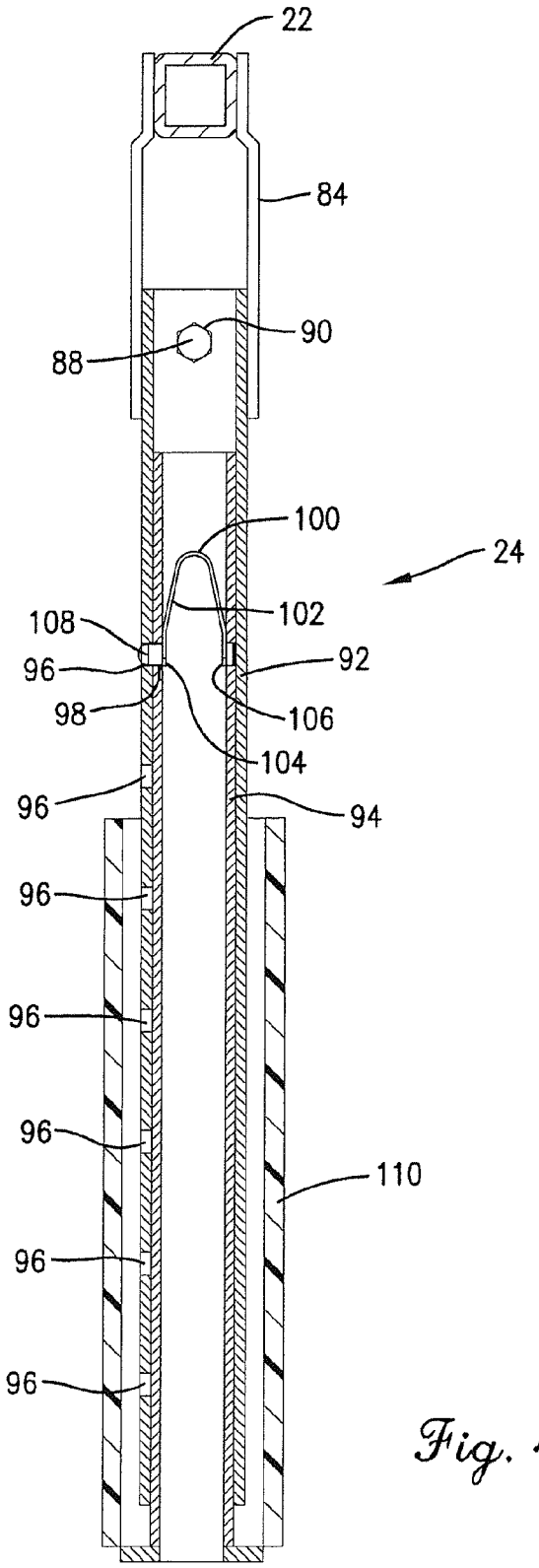

Fig. 4.

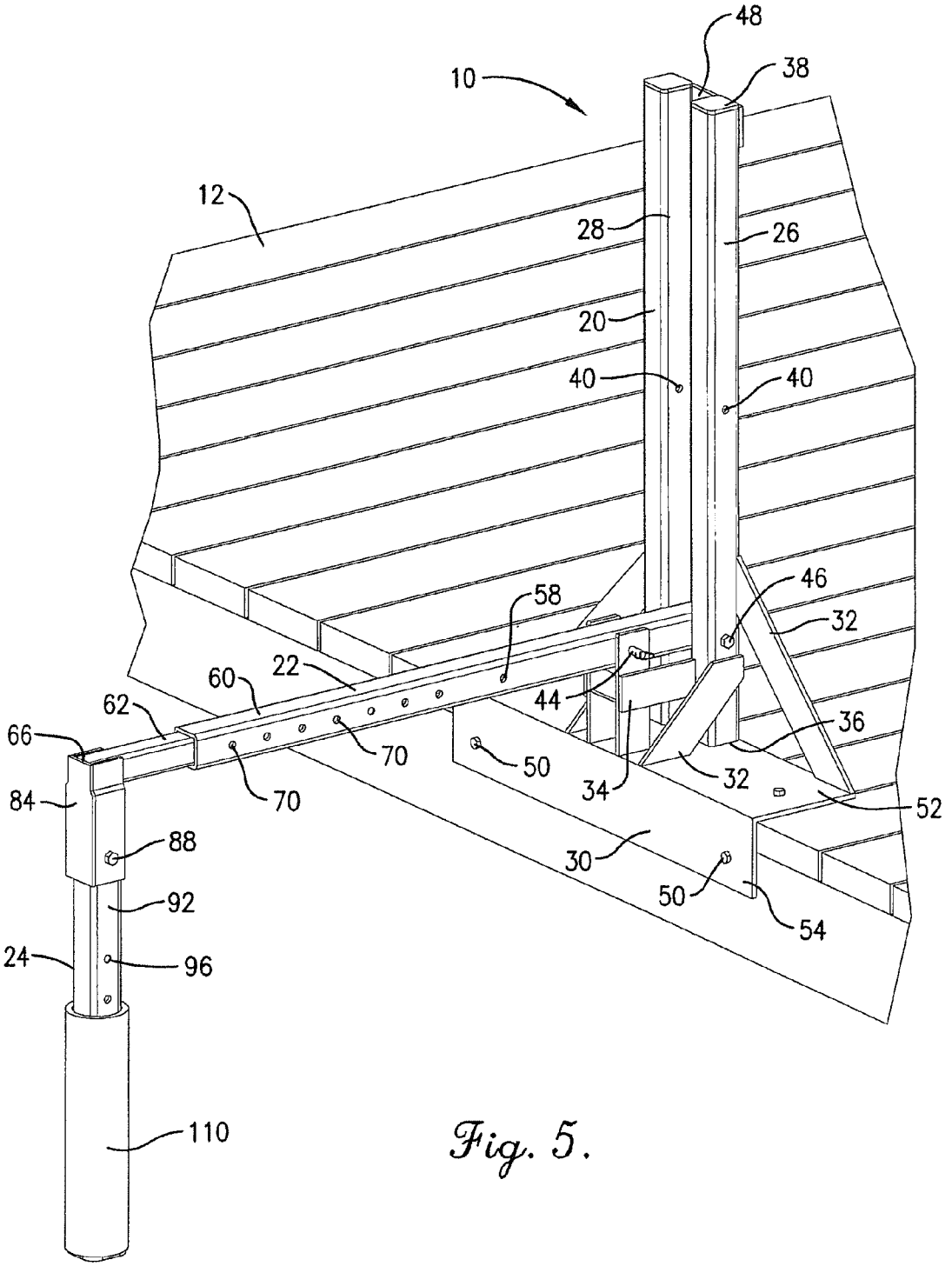
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Fig. 5.

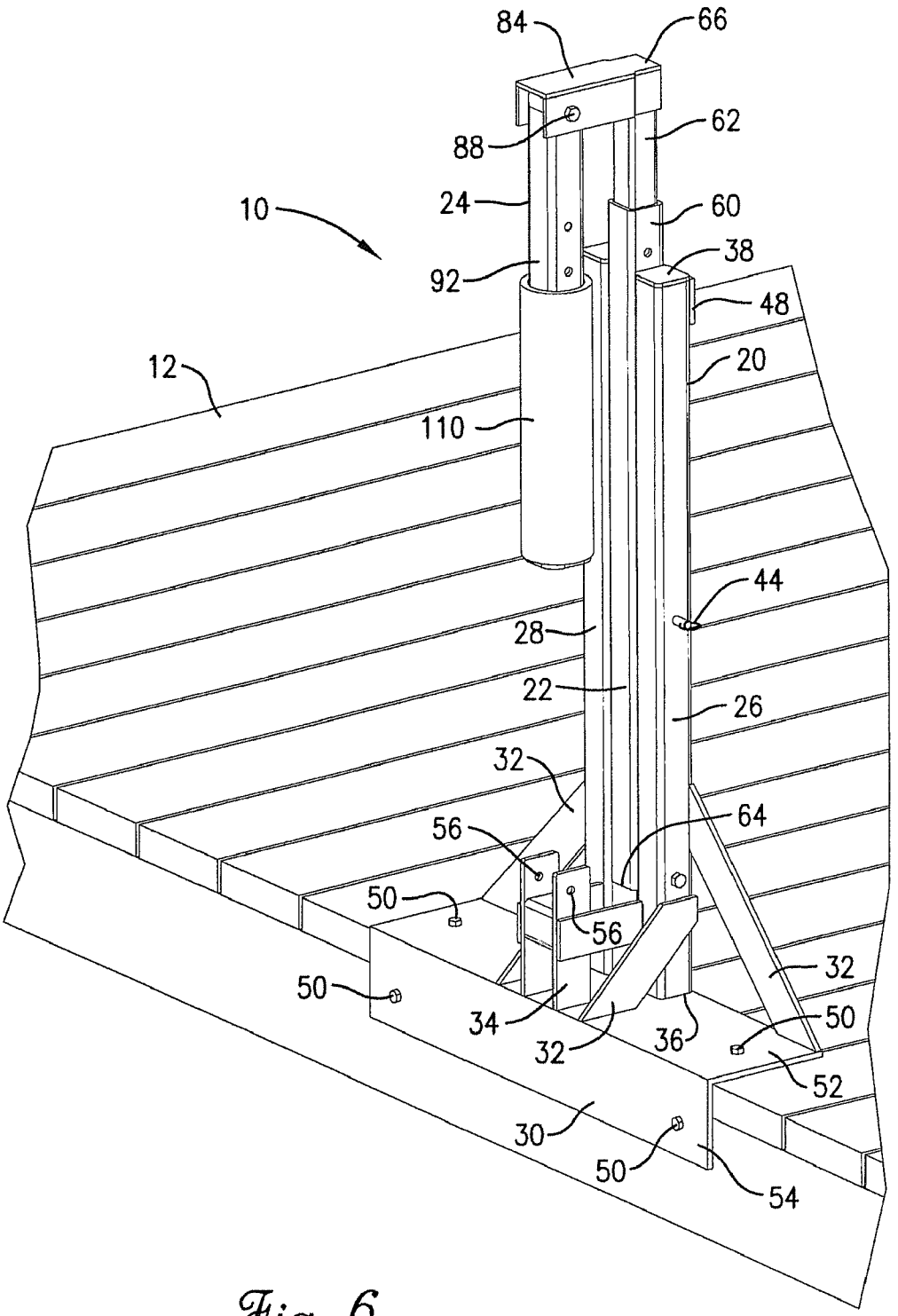
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Fig. 6.

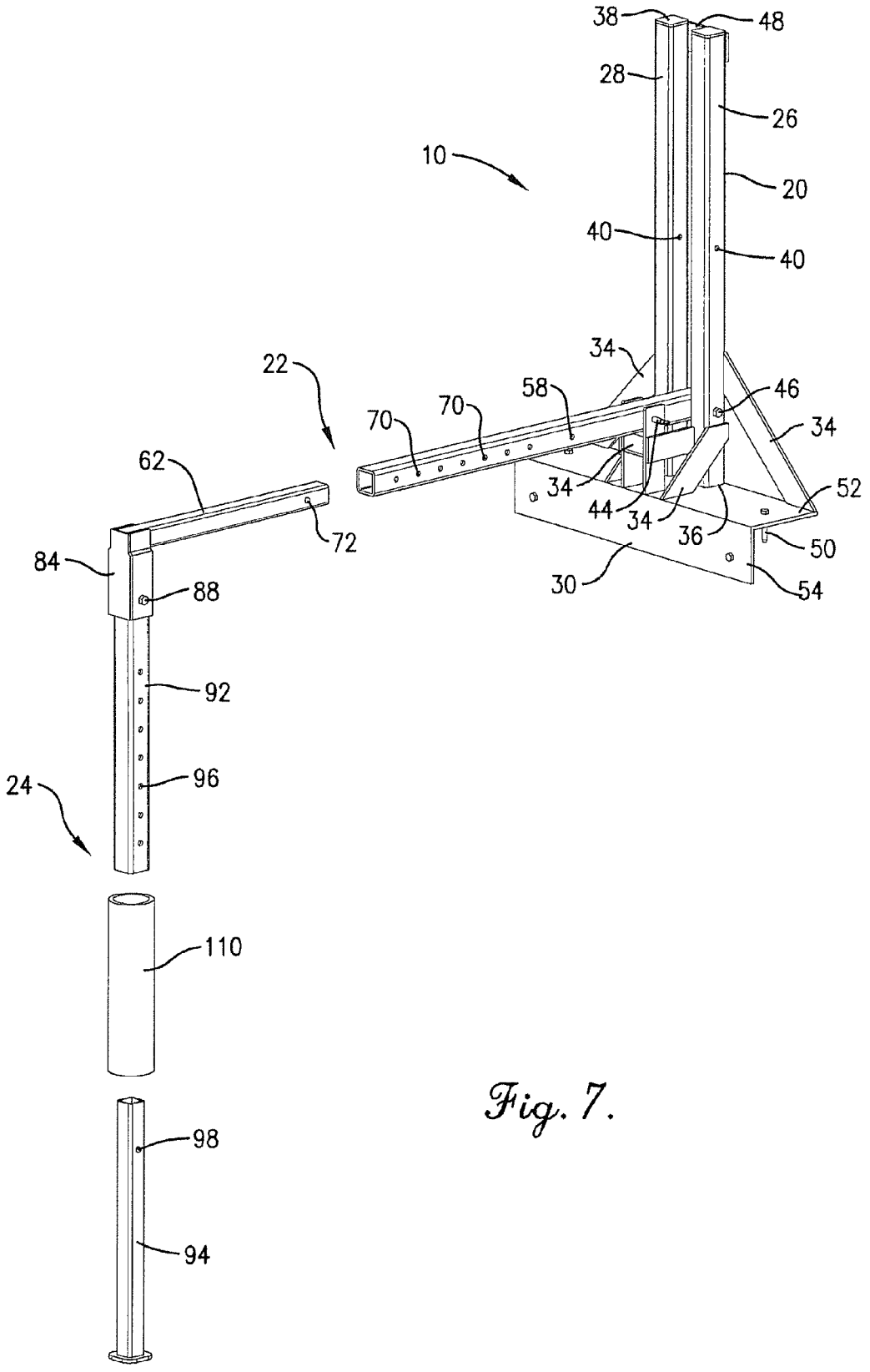
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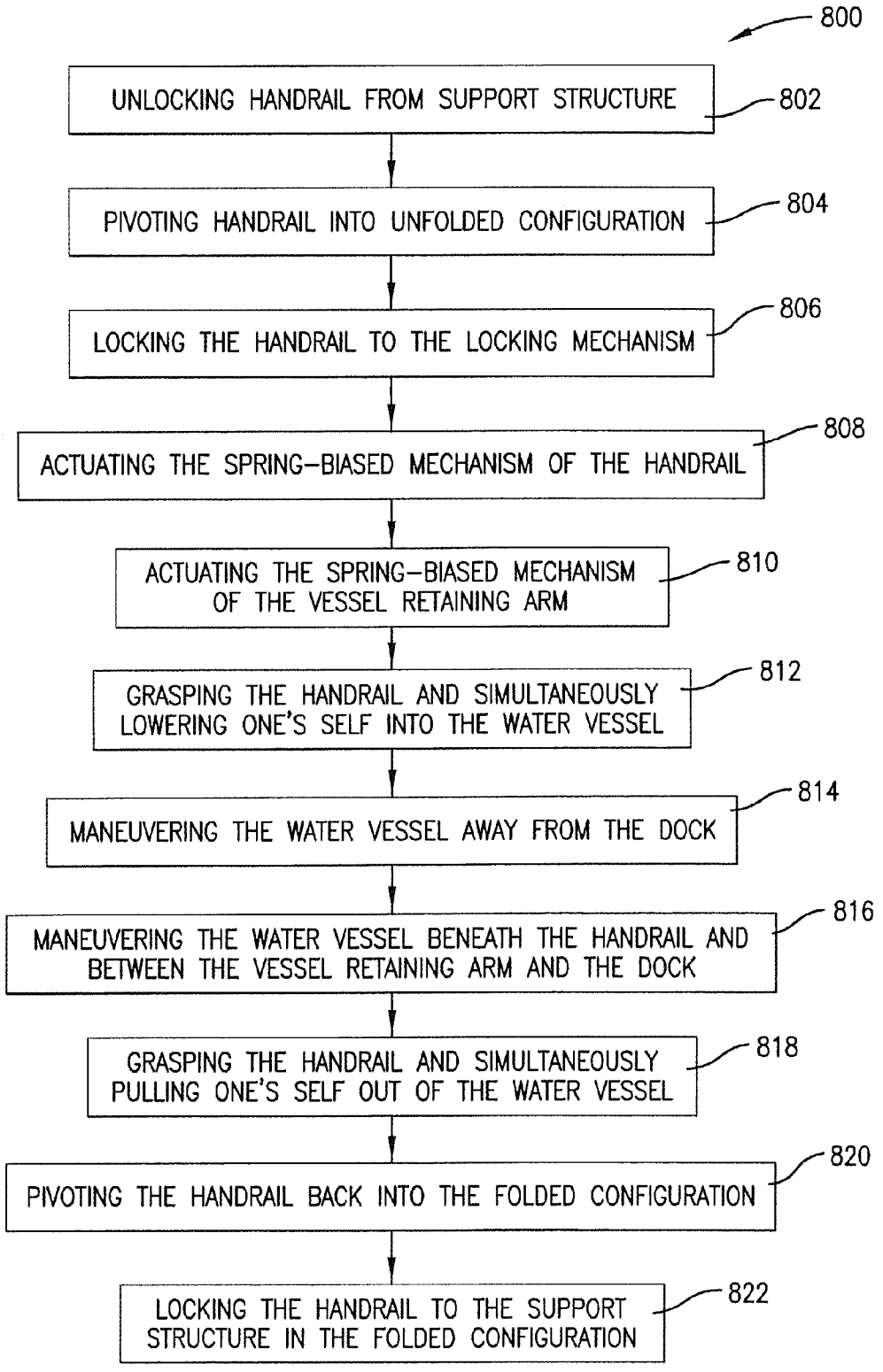
Fig. 7.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UNLOCKING HANDRAIL FROM SUPPORT STRUCTURE
802
PIVOTING HANDRAIL INTO UNFOLDED CONFIGURATION
804
LOCKING THE HANDRAIL TO THE LOCKING MECHANISM
806
ACTUATING THE SPRING-BIASED MECHANISM OF THE HANDRAIL
808
ACTUATING THE SPRING-BIASED MECHANISM OF THE VESSEL RETAINING ARM
810
GRASPING THE HANDRAIL AND SIMULTANEOUSLY LOWERING ONE'S SELF INTO THE WATER VESSEL
812
MANEUVERING THE WATER VESSEL AWAY FROM THE DOCK
814
MANEUVERING THE WATER VESSEL BENEATH THE HANDRAIL AND BETWEEN THE VESSEL RETAINING ARM AND THE DOCK
816
GRASPING THE HANDRAIL AND SIMULTANEOUSLY PULLING ONE'S SELF OUT OF THE WATER VESSEL
818
PIVOTING THE HANDRAIL BACK INTO THE FOLDED CONFIGURATION
820
LOCKING THE HANDRAIL TO THE SUPPORT STRUCTURE IN THE FOLDED CONFIGURATION
822

Fig. 8.

WATER VESSEL STABILIZATION APPARATUS

BACKGROUND

[0001] 1. Field

[0002] Embodiments of the present invention relate to an apparatus for stabilizing a kayak or other small water vessel so that a person can more easily get into and out of the vessel.

[0003] 2. Related Art

[0004] Getting into and out of kayaks and other small water vessels from a dock can be challenging for a number of reasons. First, wind or waves may cause the vessel to float in a direction away from the dock. Second, the user may tip the vessel over or fall out of the vessel while lowering themselves into it. Accordingly, a user may need something to stabilize themselves and/or the vessel as they get into and out of it.

[0005] Many different types of devices have been developed in an attempt to alleviate these problems. For example, an overhead assist bar may be mounted between two adjacent docks or sections of a single dock and may be grasped by a user as the user gets into or out of a vessel. However, this requires that the two docks or dock sections be built close enough together that the overhead assist bar of a fixed size can extend therebetween. Moreover, although such bars help a user steady him or herself, they do not help stabilize the vessel itself.

[0006] Accordingly, there is a need for an improved apparatus that assists a user while getting into and out of a water vessel.

SUMMARY

[0007] Embodiments of the present invention provide an apparatus that may be mounted virtually anywhere on a dock, pier, or other structure positioned over a body of water that allows a user to get into and out of a small water vessel, such as a kayak, canoe, jet ski, wave runner, etc. An embodiment of the apparatus may comprise a support structure fixedly secured to a dock, pier, or other structure and a handrail pivotally attached to the support structure. The support structure may comprise a base fixedly secured to the dock or other structure and a support rail extending vertically upward from the base.

[0008] The handrail may have a proximal end and a distal end. The proximal end of the handrail may be pivotally attached to the support rail at a point proximate to the base, so that the handrail may pivot between a folded configuration in which the handrail is substantially parallel to the support rail and an unfolded configuration in which the handrail is substantially perpendicular to the support rail.

[0009] In another embodiment of the invention, the apparatus may further comprise a vessel retaining arm pivotally attached to the distal end of the handrail. The vessel retaining arm may be pivotable between a folded configuration in which the vessel retaining arm is substantially parallel to the handrail and an unfolded configuration in which the vessel retaining arm is substantially perpendicular to the handrail. The apparatus may also be configured such that a length of the handrail and/or the vessel retaining arm may be adjusted via mechanical actuation.

[0010] This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the detailed description. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter. Other aspects and advantages of the present invention will be apparent from the following detailed description of the preferred embodiments and the accompanying drawing figures.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

[0011] Embodiments of the present invention are described in detail below with reference to the attached drawing figures, wherein:

[0012] FIG. **1** is an environmental perspective view of an apparatus constructed in accordance with an embodiment of the present invention, and specifically illustrates use of the apparatus to board a water vessel;

[0013] FIG. **2** is a side view of the apparatus of FIG. **1** in a deployed configuration;

[0014] FIG. **3** is a fragmentary cross-sectional view of a handrail of the apparatus of FIG. **2**;

[0015] FIG. **4** is a fragmentary cross-sectional view of a vessel retaining arm of the apparatus of FIG. **2**;

[0016] FIG. **5** is a perspective view of the apparatus of FIG. **1** in the deployed configuration;

[0017] FIG. **6** is a perspective view of the apparatus of FIG. **1** in a folded configuration;

[0018] FIG. **7** is an exploded perspective view of the apparatus of FIG. **1** in the deployed configuration; and

[0019] FIG. **8** is a flow chart illustrating a method of getting into and out of a water vessel in accordance with an embodiment of the present invention.

[0020] The drawing figures do not limit the present invention to the specific embodiments disclosed and described herein. The drawings are not necessarily to scale, emphasis instead being placed upon clearly illustrating the principles of the invention.

DETAILED DESCRIPTION

[0021] The following detailed description of the invention references the accompanying drawings that illustrate specific embodiments in which the invention can be practiced. The embodiments are intended to describe aspects of the invention in sufficient detail to enable those skilled in the art to practice the invention. Other embodiments can be utilized and changes can be made without departing from the scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense. The scope of the present invention is defined only by the appended claims, along with the full scope of equivalents to which such claims are entitled.

[0022] In this description, references to "one embodiment", "an embodiment", or "embodiments" mean that the feature or features being referred to are included in at least one embodiment of the technology. Separate references to "one embodiment", "an embodiment", or "embodiments" in this description do not necessarily refer to the same embodiment and are also not mutually exclusive unless so stated and/or except as will be readily apparent to those skilled in the art from the description. For example, a feature, structure, act, etc. described in one embodiment may also be included in other embodiments, but is not necessarily included. Thus, the present technology can include a variety of combinations and/or integrations of the embodiments described herein.

[0023] As illustrated in FIGS. **1-7**, embodiments of the present invention provide an apparatus **10** attachable to a dock **12**, pier, or other structure that extends over a body of water **14**. A user **16** may use the apparatus **10** to get into and out of a small water vessel **18**, such as a kayak, as illustrated in FIG. **1**, a canoe, a wave runner, or a jet ski. The dock **12**, as referenced herein, may be any type of dock, pier, docking structure, or any other structure positioned over the body of water **14**. The apparatus **10** broadly includes a support structure **20** attachable to the dock **12**, a handrail **22** pivotally attached to the support structure **20**, and a vessel retaining arm **24** pivotally attached to the handrail **22**.

[0024] The support structure **20** may be any rigid part configured to attach to and extend upward from the dock **12**. Specifically, the support structure **20** may comprise a base **30** configured to be fixedly secured to the dock **12** and at least one support rail **26**,**28** extending substantially vertically upward from the base **30**. The support structure **20** may further comprise one or more bracing elements **32** and/or a locking mechanism **34**, as later described herein.

[0025] Each support rail **26**,**28** may be rigid and elongated, comprising a first end **36** and a second end **38** opposite the first end **36**. The support rail **26**, **28** may be configured to extend upward, substantially perpendicular to the dock **12**. The first end **36** of each support rail **26**,**28** may be attached to, welded to, and/or integrally formed with the base **30**. The support rails **26**,**28** may have holes **40**,**42** formed therein or therethrough, configured for pins or other devices to be slid therethrough, as best illustrated in FIG. **2**. For example, at least one of the support rails **26**,**28** may have one or more locking holes **40** formed therethrough, configured to allow a locking pin **44** to be slid therethrough. Furthermore, at least one of the support rails **26**,**28** may have a pivot hole **42** positioned and configured to allow a pivot pin **46** to be slid therethrough. The locking pin **44** may secure the handrail **22** to the support structure **20** in several different configurations, as later described herein. The pivot pin **46** may extend through both the support structure **20** and the handrail **22**, such that the handrail **22** may pivot or rotate about the pivot pin **46**. However, in alternative embodiments of the invention, the pivot pin **46** may be fixed to or integrally formed with at least one of the support rails **26**,**28** and the pivot hole **42** may be omitted.

[0026] In some embodiments of the invention, as illustrated in FIGS. **1**, **5**, and **6**, the support structure **20** may specifically comprise two support rails **26**,**28** arranged parallel with each other with a space therebetween, such that when the handrail **22** is pivoted toward the support structure **20**, the handrail **22** rests between the two support rails **26**,**28** of the support structure **20**. The two support rails **26**,**28** may be solid throughout or may be substantially hollow and have a square cross-section or any desired cross-section. The two support rails **26**,**28** may be held parallel with each other by their fixed attachment to the base **30** and/or by a rigid strap **48** fixedly attached or integrally formed to each of the support rails **26**,**28**. For example, the rigid strap **48** may be fixed to the support rails **26**,**28** at or proximate to the second end **38** of each.

[0027] The base **30**, as illustrated in FIGS. **1**, **5**, **6**, and **7**, may be configured to be bolted to or otherwise attached at or proximate to an edge of the dock **12**. However, any type of base or means of securing the support structure **20** to the dock **12** may be used. The base **30** may be secured to the dock **12** by mechanical fasteners **50**, such as bolts, nails, screws, or other mechanical fasteners. In some embodiments of the invention, as illustrated in FIGS. **1** and **5**, the base **30** may be an elongated angle rail, which may comprise a first base portion **52** configured to lay on top of the dock **12** and a second base portion **54** extending at a substantially 90-degree angle from the first base portion **52**. The first base portion **52** may be attached directly to a top surface of the dock **12**, such as by way of the mechanical fasteners **50**. Furthermore, the second base portion **54** may be configured to be attached directly to a side of the dock **12**, such as by way of the mechanical fasteners **50**. In some embodiments of the invention, the base **30** or another component of the apparatus **10** may comprise a lanyard attachment component (not shown) configured to allow a lanyard or rope fixed to the water vessel **18** to attach to the lanyard attachment component, thereby securing the water vessel **18** to the dock **12**.

[0028] The bracing elements **32**, as illustrated in FIGS. **1-2** and **5-7**, may extend between the base **30** and one or both of the support rails **26**,**28**. For example, the bracing elements **32** may be fixed to both the base **30** and at least one of the support rails **26**,**28** at an angle greater than 0-degrees and less than 90-degrees, as illustrated in FIGS. **1** and **5**. The bracing elements **32** may be arranged in such a manner that the support rail **26**,**28** is braced, relative to the base **30**, against movement forward and backwards as well as movement from side to side.

[0029] The locking mechanism **34**, as illustrated in FIGS. **1-2** and **5-7**, may be any mechanism configured to temporarily fix the handrail **22** in a configuration substantially perpendicular to the support rail or rails **26**,**28**. For example, the locking mechanism **34** may be a rigid component with at least one locking hole **56** formed therethrough and fixed in a position relative to the base such that at least one corresponding locking hole **58** formed into the handrail **22** may be aligned therewith, as later described herein. The locking pin **44** may be configured to be inserted through the locking hole **56** of the locking mechanism **34** and through the locking hole **58** of the handrail **22** in order to prevent the handrail **22** from pivoting relative to the support structure **20**. In some embodiments of the invention, the locking mechanism **34** may be fixed to any elements of the support structure **20** and/or the dock **12** and may be sized and shaped to impeded the handrail **22** from pivoting more than 90-degrees relative to the support rails **26**,**28**.

[0030] The handrail **22**, as illustrated in FIGS. **1-3** and **5-7**, may comprise one or more elongated rods **60**,**62** or any part configured to pivotally attach to the support structure **20** and/or the dock **12** and to extend in a direction away from the dock **12** over the body of water **14**. Specifically, the handrail **22** may be configured to extend over the water vessel **18** or any vessel floating in the body of water **14**. The handrail **22** may comprise a proximal end **64** configured to be positioned at or nearest to the dock **12** and a distal end **66** opposite of the proximal end **64**. The handrail **22** may pivot between a folded configuration generally parallel with the support rail **26**,**28** and a unfolded configuration generally perpendicular to the support rail **26**,**28**.

[0031] The handrail **22** may have a number of holes formed therethrough, as best illustrated in FIGS. **2** and **7**. Specifically, one of the elongated rods **60**,**62** of the handrail **22** may have at least one pivot hole **68** formed therethrough and aligned with the pivot hole **42** or holes of the support structure **20**, such that the pivot pin **46** may extend through the pivot holes **42**,**68** of both the support structure **20** and the handrail **22**.

Furthermore, at least one of the elongated rods **60**,**62** of the handrail **22** may have the at least one locking hole **58** formed therethrough and configured to align with the locking mechanism's hole(s) **56** while the handrail is in the unfolded configuration and with the locking hole(s) **40** of the support rail(s) **26**,**28** while the handrail **22** is in its folded configuration.

[0032] In some embodiments of the invention, as illustrated in FIG. **3**, the one or more elongated rods **60**,**62** of the handrail **22** may comprise a first hollow rod **60** and a second hollow rod **62**, wherein the second hollow rod **62** has a smaller cross-section than the first hollow rod **60** and is slidable at least partially into and out of the first hollow rod **60**. In this embodiment of the invention, the pivot holes **68** and locking holes **58** of the handrail **22** may be formed through the first hollow rod **60**. Alternatively, the pivot holes **68** and locking holes **58** of the handrail **22** may be formed through the second hollow rod **62**. The first and second hollow rods **60**,**62** may each have a substantially square or circular cross-section or any cross-sectional shape desired.

[0033] The first hollow rod **60** may have a plurality of length-adjustment holes **70** formed therethrough and spaced at intervals along a length of the first hollow rod **60**. The second hollow rod **62** may comprise at least one length-adjustment hole **72** formed therethrough and configured to align with the length-adjustment holes **70** of the first hollow rod **60**. Additionally, the handrail **22** may also comprise a spring-biased mechanism **74** resting at least partially within the second hollow rod **62** and at least partially extending through the length-adjustment hole **72** of the second hollow rod **62**, as illustrated in FIG. **3**.

[0034] For example, the spring-biased mechanism **74** may have a spring portion **76** having a first end **78** and a second end **80** and a tab portion **82** attached to or integral with the second end **80** of the spring portion **76**. The first end **78** of the spring portion **76** may or may not be fixed to a surface within the second hollow rod **62**. The tab portion **82** may extend through the length-adjustment hole **72** of the second hollow rod **62** and at least one of the length-adjustment holes **70** of the first hollow rod **60** when these length-adjustment holes **70**,**72** are aligned with each other.

[0035] When the tab portion **82** is pressed inward toward the spring portion **76**, the first hollow rod **60** may be operable to be slid toward or away from the support structure **20** of the apparatus **10** until another of the length-adjustment holes **70** of the first hollow rod **60** aligns with the length adjustment hole **72** of the second hollow rod **62**, allowing the tab portion **82** to spring out through the aligned length-adjustment holes **70**,**72**. In alternative embodiments of the invention, not shown herein, there may be aligned length-adjustment holes on two opposing sides of the first hollow rod **60** and/or the second hollow rod **62** and there may be tab portions **82** on each end **78**,**80** of the spring portion **76**, such that simultaneously squeezing both tab portions **82** toward the spring portion **76** is required to adjust the length of the handrail **22**.

[0036] The handrail **22** may also comprise an attachment part **84**, as illustrated in FIGS. **1**-**7**, fixed to or integrally formed with one of the elongated rods **60**,**62** at or proximate to the distal end **66** of the handrail **22**. For example, the attachment part **84** may be attached to the second hollow rod **62** and may be substantially perpendicular to the second hollow rod **62**. The attachment part **84** may comprise at least one retaining arm pivot hole **86** formed therethrough configured to receive a retaining arm pivot pin **88** about which the vessel retaining arm **24** may pivot, as illustrated in FIGS. **5**-**6**. The attachment portion **84** may be also be configured to prevent the vessel retaining arm **24** from pivoting greater than substantially 90-degrees relative to the handrail **22**.

[0037] In some alternative embodiments of the invention, the retaining arm pivot hole **86** may extend through one of the elongated rods **60**,**62**, such as the second hollow rod **62**, and the attachment part **84** may be omitted. However, advantageously, the attachment part **84** allows for the vessel retaining arm **24** to rest a distance apart from and substantially parallel to the handrail **22** when the handrail **22** is in the folded configuration, as illustrated in FIG. **6**.

[0038] The vessel retaining arm **24**, as illustrated in FIGS. **1**-**2** and **4**-**7**, may freely pivot relative to the distal end **66** and/or the attachment part **84** of the handrail **22** between a folded configuration and an unfolded configuration. The vessel retaining arm **24** may remain substantially vertical and substantially parallel to the support rails **26**,**28** as the handrail **22** pivots between its folded and unfolded configurations. In its unfolded configuration, the vessel retaining arm **24** rests at about a 90-degree angle relative to the handrail **22** and extends therefrom in a direction toward the body of water **14**. The vessel retaining arm **24** may pivot about the retaining arm pivot pin **88** relative to the handrail **22**. The vessel retaining arm **24** may therefore also comprise at least one pivot hole **90** formed therethrough and operable to receive the retaining arm pivot pin **88**.

[0039] As illustrated in FIG. **4**, the vessel retaining arm **24** may comprise a third hollow rod **92** and a fourth hollow rod **94** similar in construction and operation to the first hollow rod **60** and the second hollow rod **62** of the handrail **22**. Specifically, the third and fourth hollow rods **92**,**94** may be slidable relative to each other to mechanically lengthen or shorten the vessel retaining arm **24**. In one embodiment of the invention, as illustrated in FIG. **4**, the fourth hollow rod **94** may have a smaller cross-section than the third hollow rod **92** and may slide into the third hollow rod **92**. Furthermore, the third hollow rod **92** may have the vessel retaining arm's pivot hole **90** formed therethrough. Alternatively, the vessel retaining arm's pivot hole **90** may be formed through the fourth hollow rod **94**. The third and fourth hollow rods **92**,**94** may each have a substantially square or circular cross-section or any cross-sectional shape desired.

[0040] The third hollow rod **92** may have a plurality of length-adjustment holes **96** formed therethrough and spaced at intervals along a length of the third hollow rod **92**. The fourth hollow rod **94** may comprise at least one length-adjustment hole **98** formed therethrough and configured to align with the length-adjustment holes **96** of the third hollow rod **92**. Additionally, the vessel retaining arm **24** may also comprise a spring-biased mechanism **100** resting at least partially within the fourth hollow rod **94** and at least partially extending through the length-adjustment hole **98** of the fourth hollow rod **94**.

[0041] For example, the spring-biased mechanism **100** in the fourth hollow rod **94**, as illustrated in FIG. **4**, may have a spring portion **102** having a first end **104** and a second end **106** and a tab portion **108** attached to or integral with the second end **106** of the spring portion **102**. The first end **104** of the spring portion **102** may or may not be fixed to a surface within the fourth hollow rod **94**. The tab portion **108** may extend through the length-adjustment hole **98** of the fourth hollow rod **94** and at least one of the length-adjustment holes **96** of the third hollow rod **92** when these length-adjustment holes

96,98 are aligned with each other. When the tab portion 108 of the vessel retaining arm's spring-biased mechanism 100 is pressed inward toward the spring portion 102 thereof, the fourth hollow rod 94 may be slid toward or away from the handrail 22 of the apparatus 10 until another of the length-adjustment holes 96 of the third hollow rod 92 aligns with the length adjustment hole 98 of the fourth hollow rod 94, allowing the tab portion 108 to spring out through the aligned length-adjustment holes 96,98. In alternative embodiments, not shown herein, there may be alignable length-adjustment holes on two opposing sides of the third hollow rod 92 and/or the fourth hollow rod 94 and there may be tab portions 108 on each end 104,106 of the spring portion 102, such that squeezing both tab portions 108 toward the spring portion 102 is required to adjust the length of the vessel retaining arm 24.

[0042] The vessel retaining arm 24 may also comprise a covering portion 110 configured to attach to or be integrally formed with a portion of the fourth hollow rod 94 positioned outward of the third hollow rod 92. The covering portion 110 may also be hollow and may comprise a cross-section large enough to allow the covering portion 110 to slide over the third hollow rod 92 when the fourth hollow rod 94 is slid into the third hollow rod 92, as illustrated in FIG. 4. In some embodiments of the invention, the covering portion 110 may be made of a plastic, rubber, or other water-resistant material, thereby protecting the vessel retaining arm 24 from water damage and protecting the water vessel 18 from being scraped by the vessel retaining arm 24. Specifically, the covering portion 110 may be configured to extend into the body of water 14 and assist in trapping the water vessel 18 between the vessel retaining arm 24 and the dock 12. In an alternative embodiment of the invention in which the fourth hollow rod 94 is pivotally attached to the handrail 22, the covering portion 110 may be attached to or formed integrally with the third hollow rod 92.

[0043] The apparatus 10 may be reconfigurable between a folded configuration, as illustrated in FIG. 6, and a fully deployed configuration, as illustrated in FIGS. 1-2 and 5. When the apparatus 10 is in its folded configuration, the support structure 20, the handrail 22, and the vessel retaining arm 24 may each rest substantially parallel with each other, as illustrated in FIG. 6, with the handrail 22 in its folded configuration relative to the support structure 20 and the vessel retaining arm 24 in its folded configuration relative to the handrail 22. When the apparatus 10 is in its fully deployed configuration, as illustrated in FIGS. 1-2 and 5, the handrail 22 extends outward over the body of water 14 to rest substantially perpendicular relative to both the support structure 20 and to the vessel retaining arm 24, with the handrail 22 in its unfolded configuration relative to the support structure 20 and the vessel retaining arm 24 in its unfolded configuration relative to the handrail 22.

[0044] In use, a user may attach the apparatus 10 to an edge of any dock 12 at its base 30, as illustrated in FIGS. 1, 5, and 6. For example, the first base portion 52 may be attached directly to a top surface of the dock 12 and/or the second base portion 54 may be attached directly to a side surface of the dock 12. The user 16 may also mechanically adjust the lengths or extended lengths of the handrail 22 and of the vessel retaining arm 24 when the apparatus 10 is in the fully-deployed configuration, in the folded configuration, or somewhere between the folded and the fully-deployed configuration. For example, the user 16 may actuate the spring-biased mechanisms 74,100, pressing the one or two tab portions 82,108 toward the spring portions 76,102, as described above, to allow the first and second hollow rods 60,62 and/or the third and fourth hollow rods 92,94 to slide relative to each other by a desired amount.

[0045] In particular, a length of the handrail 22 may be adjusted in a direction away from (longer) or closer to (shorter) the support structure 20 of the apparatus 10 in the fully-deployed configuration, as desired, depending on the size of the water vessel 18 over which the handrail 22 is intended to extend. For example, the length of the handrail 22 may be set to a size which will trap the water vessel 18 between the vessel retaining arm 24 and the dock 12, so that the water vessel 18 can not pass therethrough. Furthermore, the vessel retaining arm 24 may extend away from (longer) or toward (shorter) the handrail 22 of the apparatus 10 in the fully-deployed configuration, as desired, depending on the level of the water 14 relative to the dock 12.

[0046] To reconfigure the apparatus 10 from the fully-deployed configuration, as illustrated in FIGS. 1 and 5, into the folded configuration, as illustrated in FIG. 6, the user 16 may first unlock the handrail 22. Specifically, the user 16 may remove the locking pin 44 from the locking hole 56 formed through the locking mechanism 34. Then the user 16 may lift or pivot the handrail 22 toward the support structure 20. This may cause the vessel retaining arm 24 to also pivot relative to the handrail 22. Additionally or alternatively, the vessel retaining arm 24 may have a locking mechanism (not shown) which will need to be unlocked before it can pivot. In some embodiments of the invention, the handrail 22 may be prevented from pivoting any further by the rigid strap 48. When the handrail 22 contacts the rigid strap 48, at least some of the locking holes 40,58 of the support rail(s) 26,28 and the handrail 22 may be aligned. Then the user may insert the locking pin 44, previously removed from the locking mechanism 34, through the locking holes 40,58 of the support rail(s) 26,28 and the handrail 22, thereby locking the handrail 22 in the folded configuration.

[0047] To reconfigure the apparatus 10 from the folded configuration, as illustrated in FIG. 6, into the fully-deployed configuration, as illustrated in FIGS. 1 and 5, the user 116 may first unlock the handrail 22 from the support rail(s) 26,28. Specifically, the locking pin 44 may be removed from the locking holes 40,58 of the support rail(s) 26,28 and the handrail 22. Then the user 16 may pivot the handrail 22 away from the support rail(s) 26,28 toward the locking mechanism 34. The locking mechanism 34 may be configured to prevent further pivoting of the handrail 22 once the handrail 22 is substantially perpendicular to the support rail(s) 26,28. In this position, the locking holes 58 of the handrail 22 may be aligned with the locking hole(s) 56 of the locking mechanism 34. Then the user 16 may insert the locking pin 44 previously removed from the support rail(s) 26,28 through the locking holes 56,58 of the locking mechanism 34 and the handrail 22.

[0048] To use the apparatus 10 to get into the water vessel 18, the user 16 may first pivot the handrail 22 into its unfolded configuration, then place the water vessel 18 into the body of water 14 between the vessel retaining arm 24 and the dock 12, such that the handrail 22 extends over the water vessel 18 in a direction perpendicular to a length of the water vessel 18, as illustrated in FIG. 1. The user 16 may then grasp the support structure 20, the handrail 22, and/or the vessel retaining arm 24 while lowering themselves into the water vessel 18.

[0049] The user 16 may then maneuver the water vessel 18 away from the dock 12 and then later return and maneuver the

water vessel **18** toward the dock. When the user **16** returns to the dock **12**, they may position the water vessel **18** between the vessel retaining arm **24** and the dock **12**. Then the user **16** may grasp the support structure **20**, the handrail **22**, and/or the vessel retaining arm **24** to stabilize themselves as they stand in the water vessel **18** and then step onto the dock **12**. Once the user **16** is on the dock **12**, they may pivot the handrail **22** and vessel retaining arm **24** back to the folded configuration and then use the locking pin **44**, as described above, to retain the apparatus **10** in the folded configuration.

[0050] The flow chart of FIG. **8** depicts the steps of an exemplary method **800** of getting into and out of the water vessel **18** using the apparatus **10** in more detail. In some alternative implementations, the functions noted in the various blocks may occur out of the order depicted in FIG. **8**. For example, two blocks shown in succession in FIG. **8** may in fact be executed substantially concurrently, or the blocks may sometimes be executed in the reverse order depending upon the functionality involved.

[0051] The method **800** of using the apparatus **10** attached to the dock **12** to get into and out of the water vessel **18** may comprise the steps of unlocking the handrail **22** from the support structure **20**, as depicted in block **802**, then pivoting the handrail **22** from its folded configuration, as illustrated in FIG. **6**, to its unfolded configuration, as illustrated in FIG. **5**, such that the handrail **22** extends over the water vessel **18**, as depicted in block **804** and illustrated in FIGS. **1-2**. Next, the method **800** may comprise the steps of locking the handrail **22** to the locking mechanism **34** in the fully-deployed configuration, as depicted in block **806**, and/or actuating the spring-biased mechanism **74** of the handrail **22** such that the handrail **22** may be reconfigured to span a greater or a shorter distance relative to the dock **12**, as depicted in block **808**. Additionally, the method **800** may comprise a step of actuating the spring-biased mechanism **100** of the vessel retaining arm **24** such that the vessel retaining arm **24** may be reconfigured to span a greater or a shorter distance relative to the handrail **22**, as depicted in block **810**.

[0052] Then, the method **800** may comprise the steps of grasping the support structure **20**, the handrail **22**, and/or the vessel retaining arm **24** while simultaneously lowering one's self into the water vessel **18**, as depicted in block **812**, and maneuvering the water vessel **18** away from the dock **12** and the apparatus **10**, as depicted in block **814**. The method **800** may further comprise the step of maneuvering the water vessel **18** back toward the dock **12** and the apparatus **10** until the water vessel **18** is positioned beneath the handrail **22** and between the vessel retaining arm **24** and the dock **12**, as depicted in block **816**. Then, the method **800** may comprise the steps of grasping the support structure **20**, the handrail **22**, and/or the vessel retaining arm **24** while simultaneously pulling one's self out of the water apparatus **18**, as depicted in block **818**, and pivoting the handrail **22** back into the folded configuration, as depicted in block **820** and illustrated in FIG. **6**. Finally, the method **800** may comprise the step of locking the handrail **22** relative to the support structure **20** in the folded configuration, as depicted in block **822** and illustrated in FIG. **6**.

[0053] Although the invention has been described with reference to the preferred embodiment illustrated in the attached drawing figures, it is noted that equivalents may be employed and substitutions made herein without departing from the scope of the invention as recited in the claims. For example, in some alternative embodiments of the invention, the spring-biased mechanisms **74**,**100** may be omitted and additional locking pins (not shown) may be inserted through aligned ones of the length-adjustment holes **70**,**72**,**96**,**98** to prevent sliding between the first and second hollow rails **60**,**62** and/or the third and fourth hollow rails **92**,**94**.

Having thus described various embodiments of the invention, what is claimed as new and desired to be protected by Letters Patent includes the following:

1. An apparatus mountable to a structure for assisting a user while getting into and out of a water vessel, the apparatus comprising:

a support structure including a base configured to be fixedly secured to the structure and a support rail extending upwardly from the base; and

a handrail having a proximal end and a distal end, the proximal end being pivotally attached to the support structure at a point proximate to the base, so that the handrail may pivot between a folded configuration in which the handrail is substantially parallel to the support rail and an unfolded configuration in which the handrail is substantially perpendicular to the support rail.

2. The apparatus of claim **1**, further comprising a vessel retaining arm pivotable relative to the handrail about a point proximate to the distal end of the handrail, wherein the vessel retaining arm is substantially perpendicular to the handrail when the handrail is in the unfolded configuration and is substantially parallel to the handrail when the handrail is in the folded configuration.

3. The apparatus of claim **2**, further comprising an attachment part fixed substantially perpendicular to the distal end of the handrail, wherein the vessel retaining arm is pivotally attached to the attachment part.

4. The apparatus of claim **1**, wherein the handrail further comprises a first hollow rail and a second hollow rail mechanically slidable relative to each other such that a length of the handrail is mechanically adjustable.

5. The apparatus of claim **2**, wherein the vessel retaining arm further comprises a third hollow rail and a fourth hollow rail mechanically slidable relative to each other such that a length of the vessel retaining arm is mechanically adjustable.

6. The apparatus of claim **1**, further comprising a locking mechanism configured to fix the handrail in its unfolded configuration.

7. The apparatus of claim **1**, wherein the support structure comprises two support rails spaced apart parallel with each other such that the handrail rests between the two support rails in the folded configuration.

8. The apparatus of claim **1**, further comprises a locking pin, wherein the support structure has at least one locking hole formed therethrough and the handrail has at least one locking hole formed therethrough, such that the locking hole of the support structure aligns with the locking hole of the handrail when the apparatus is in the folded configuration, such that the locking pin, when slid into both of the locking holes, retains the apparatus in the folded configuration.

9. An apparatus mountable to a docking structure for assisting a user while getting into and out of a small water vessel, the apparatus comprising:

a support structure including a base configured to be fixedly secured to the docking structure and a support rail extending upwardly from the base;

a handrail having a proximal end and a distal end, the proximal end being pivotally attached to the support structure at a point proximate to the base so that the

handrail may pivot between a folded configuration in which the handrail is substantially parallel to the support rail and an unfolded configuration in which the handrail is substantially perpendicular to the support rail; and

a vessel retaining arm pivotable relative to the handrail about a point proximate to the distal end of the handrail, wherein the vessel retaining arm is substantially perpendicular to the handrail when the handrail is in its unfolded configuration and is substantially parallel to the handrail when the handrail is in its folded configuration.

10. The apparatus of claim **9**, further comprising an attachment part fixed substantially perpendicular to the distal end of the handrail, wherein the vessel retaining arm is pivotally attached to the attachment part and the attachment part is configured to prevent the vessel retaining arm from pivoting greater than approximately 90-degrees relative to the handrail.

11. The apparatus of claim **9**, wherein the handrail further comprises a first hollow rail and a second hollow rail slidable into and out of the first hollow rail such that a length of the handrail is mechanically adjustable by sliding the second hollow rail in at least one of a direction toward and a direction away from the first hollow rail.

12. The apparatus of claim **11**, wherein the first hollow rail and the second hollow rail each comprise at least one length-adjustment hole formed therethrough, wherein the handrail further comprises a spring-biased mechanism positioned within the second hollow rail, the spring-biased mechanism including at least one tab portion configured to extend through the length-adjustment hole of the second hollow rail and through the length-adjustment hole of the first hollow rail when the length-adjustment hole of the first hollow rail is aligned with the length-adjustment hole of the second hollow rail.

13. The apparatus of claim **12**, wherein the spring-biased mechanism is configured to prevent the second hollow rail from sliding relative to the first hollow rail when the tab portion is extending through the length-adjustment hole of the first hollow rail, and wherein the spring-biased mechanism is configured to allow the second hollow rail to slide relative to the first hollow rail when the tab portion is pushed inward through the length-adjustment hole of the first hollow rail.

14. The apparatus of claim **9**, wherein the vessel retaining arm further comprises a third hollow rail and a fourth hollow rail slidable into and out of the third hollow rail such that a length of the vessel retaining arm is mechanically adjustable by sliding the fourth hollow rail in at least one of a direction toward and a direction away from the third hollow rail.

15. The apparatus of claim **9**, further comprising a locking mechanism configured to temporarily fix the handrail in the unfolded configuration and configured to prevent the handrail from rotating beyond a substantially 90-degree angle relative to the support structure when the handrail pivots from its folded configuration to its unfolded configuration.

16. The apparatus of claim **9**, wherein the support structure comprises two support rails spaced apart and substantially parallel with each other such that the handrail rests between the two support rails in the folded configuration.

17. The apparatus of claim **16**, wherein a rigid strap extends between the two support rails and is configured to prevent the handrail from rotating past the support rails when the handrail pivots from its unfolded configuration to its folded configuration.

18. An apparatus mountable to a docking structure for assisting a user while getting into and out of a small water vessel, the apparatus comprising:

a support structure including a base configured to be fixedly secured to at least one of a top and a side of the docking structure and two support rail extending upwardly from the base;

a handrail having a proximal end and a distal end, the proximal end being pivotally attached to the support structure at a point proximate to the base so that the handrail may pivot between a folded configuration in which the handrail is substantially parallel to the two support rails and rests between the two support rails, and an unfolded configuration in which the handrail is substantially perpendicular to the two support rails; and

a vessel retaining arm pivotable relative to the handrail about a point proximate to the distal end of the handrail, wherein the vessel retaining arm is substantially perpendicular to the handrail when in the handrail is in its unfolded configuration and is substantially parallel to the handrail when the handrail is in its folded configuration,

wherein a length of at least one of the handrail and the vessel retaining arm are mechanically adjustable.

19. The apparatus of claim **18**, further comprising an attachment part fixed substantially perpendicular to the distal end of the handrail, wherein the vessel retaining arm is pivotally attached to the attachment part and the attachment part is configured to prevent the vessel retaining arm from pivoting greater than approximately 90-degrees relative to the handrail.

20. The apparatus of claim **18**, further comprising a locking mechanism configured to temporarily fix the handrail in its unfolded configuration and configured to prevent the handrail from rotating beyond a substantially 90-degree angle relative to the support structure when the handrail pivots from its folded configuration to its unfolded configuration.

21. The apparatus of claim **18**, wherein a rigid strap extends between the two support rails and is configured to prevent the handrail from rotating past the support rails when the handrail pivots from its unfolded configuration to its folded configuration.

22. The apparatus of claim **18**, wherein the support structure has at least one locking hole formed therethrough and the handrail has at least one locking hole formed therethrough, such that the locking hole of the support structure aligns with the locking hole of the handrail when the apparatus is in the folded configuration, such that a locking pin slid into the aligned locking holes retains the apparatus in the folded configuration.

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