equivalent constructions do not depart from the ~~spirit and~~ scope of the invention as set forth in the appended claims. The novel features which are believed to be characteristic of the invention, both as to its organization and method of operation, together with further objects and advantages will be better understood from the following description when considered in connection with the accompanying figures. It is to be expressly understood, however, that each of the figures is provided for the purpose of illustration and description only and is not intended as a definition of the limits of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] For a more complete understanding of the present invention, reference is now made to the following descriptions taken in conjunction with the accompanying drawing, in which:

[0013] FIG. 1 is a cross section of a riser showing an embodiment of the invention embedded therein;

[0014] FIG. 2 is a profile cross section of a riser showing a scissor jack that may be used to deploy collapsible fairings;

[0015] FIG. 3 is a plane view of the top of a collapsible fairing storage box;

[0016] FIG. 4 is a cross section of a collapsible fairing storage box illustrating a scissor jack with cross bars;

[0017] FIG. 5 is the profile view of a riser with a deployed collapsible fairing shown straight on;

[0018] FIG. 6 is a cross section of a riser showing a stowed collapsible fairing;

[0019] FIG. 7 is a cross section of a riser showing a deployed collapsible fairing;

fairing 100 hugs the riser 102 without having to store the fairing in an additional containment box.

[0067] Figs. 35-38 illustrate another embodiment for attaching a collapsible riser fairing to a riser which is comprised of a buoyancy module made from two layers. The collapsible riser fairing embodiments of Figs. 12-15, and 32-34 may be attached to the riser by the following attachment embodiment. Fig. 35 shows a buoyancy modules that is composed of two layers, the inner layer 3500 and an outer layer 3502. The layers be comprised of two separate sides which are attached around the riser 102 securely by mechanical attachments 3504. The inner 3500 and outer 3502 layers of the buoyancy joint may be comprised of buoyant or buoyant neutral material. The outer layer 3502 houses the collapsible fairing 100.

[0068] Although the present invention and its advantages have been described in detail, it should be understood that various changes, substitutions and alterations can be made herein without departing from the ~~spirit and~~ scope of the invention as defined by the appended claims. Moreover, the scope of the present application is not intended to be limited to the particular embodiments of the process, machine, manufacture, composition of matter, means, methods and steps described in the specification. As one of ordinary skill in the art will readily appreciate from the disclosure of the present invention, processes, machines, manufacture, compositions of matter, means, methods, or steps, presently existing or later to be developed that perform substantially the same function or achieve substantially the same result as the corresponding embodiments described herein may be utilized according to the present invention. Accordingly, the appended claims are intended to include within their scope such processes, machines, manufacture, compositions of matter, means, methods, or steps.

CLAIMS

What is claimed is:

1. ~~A~~ An apparatus containing a collapsible marine riser fairing for semi-permanent attachment to a marine riser comprising:

a storage system containing collapsible fairing members ~~configured to~~ having ~~retract~~ retractable components for retracting into ~~a storage space~~ and ~~be~~ being deployed from the storage ~~space~~ system, wherein the storage system is fully contained on the riser ~~when needed,~~ ;

the storage ~~space~~ system including members for ~~being~~ semi-permanently ~~attached~~ attaching the storage system to a riser or a storage system module for semi-permanently attaching ~~contained~~ the fairing within a portion of the riser in which the storage system module is contained within vertical boundaries of the riser~~,~~;

wherein the storage ~~space~~ system allows ~~is capable of~~ for rotation of the fairing about a vertical axis of the ~~raiser~~riser.

2. The apparatus of claim 1, wherein the storage ~~space~~ system is a storage box.

3. The apparatus of claim ~~2~~1, wherein the storage ~~box~~ system members ~~additionally~~ comprises low friction attachment straps for attaching the ~~box~~ storage system to the riser.

4. The apparatus of claim 1, wherein the ~~collapsible riser fairing~~storage system module is ~~stowed~~ contained within a space ~~within~~ in a buoyancy joint or an encapsulated joint of the riser.

5. The apparatus of claim 1, wherein the retractable components of the fairing members ~~of the collapsible fairing~~ comprises interlocking panels that ~~are adapted to~~ fold into the storage ~~space~~ system and form a pyramid type shape when deployed.

6. The apparatus of claim 5, wherein the interlocking panels include locking studs.

7. The apparatus of claim 5, wherein additional material is attached to the outside of the members ~~in order~~ to ~~create~~ provide a smooth foil upon deployment of ~~when~~ the members ~~are deployed~~.

8. The apparatus of claim 1, wherein the retractable components of the fairing members ~~of the collapsible fairing~~ comprise foldable sections.

9. The apparatus of claim 8, wherein the foldable sections are adapted to collapse to a map fold.

10. The apparatus of claim 8, wherein the foldable sections are adapted to collapse to an accordion fold.

11. The apparatus of claim 1, wherein the ~~fairing~~ storage system further comprises a deployment mechanism for deploying the collapsible fairing from the storage ~~space~~system.

12. The apparatus of claim 11, wherein the deployment mechanism is a scissor jack.

13. The apparatus of claim 1, wherein a member of the collapsible fairing comprises a wing section.

14. The apparatus of claim 13, wherein the retractable components of the fairing members comprise two wings sections that are spaced apart and attached ~~to~~ within the ~~riser~~storage system.

15. The apparatus of 14, wherein malleable material is attached to and between the two wing sections and is adapted to form a smooth foil when the collapsible fairing is deployed.

16. The apparatus of claim 4, wherein the storage system module is fully contained within the buoyancy joint space or within the encapsulated joint of the riser.