CLAIMS

1. A working system comprising:

a floating type floating structure; and

a working ship configured to perform at least installation or maintenance of the floating structure, wherein:

the floating structure includes a column section whose peripheral surface is located at a waterline when the floating structure is floating, a ballast section arranged below the column section, and a flange section arranged at an intermediate portion of the column section,

the working ship includes a gripping section capable of engaging with the flange section,

the floating structure or the working ship includes a raising/lowering device configured to raise and lower the floating structure or the working ship, and

with the gripping section of the working ship engaged with the flange section of the floating structure in a floating state, the floating structure or the working ship is raised or lowered to secure the floating structure to the working ship.

2. The working system according to claim 1, wherein the raising/lowering device is a ballast adjusting device provided in the ballast section of the floating structure, or a ballast adjusting device provided in the working ship, or a jack capable of raising and lowering the gripping section together with the working ship.

3. The working system according to claim 1, wherein the column section is slenderer than the ballast section.

4. The working system according to claim 1, wherein the ballast section has a ballast tank to and from which water can be supplied and discharged, and water is supplied

to and discharged from the ballast tank in accordance with lowering and raising by the raising/lowering device.

5. The working system according to claim 4, wherein the working ship includes a controller configured to control the supply and discharge of water to and from the ballast tank, and a monitor configured to monitor posture of the floating structure.

6. The working system according to claim 1, wherein the gripping section has a pronged unit with a recess corresponding in shape to a circumferential half of the peripheral surface of the column section and is arranged at a bow of the working ship.

7. The working system according to claim 1, wherein the gripping section has an elastic member arranged at a portion thereof where the gripping section comes into contact with the floating structure, or a supporting member configured to restrict horizontal movement of the flange section.

8. The working system according to claim 1, wherein the flange section is configured so as to be attachable and detachable.

9. The working system according to claim 1, wherein the floating structure is a spar type floating body.

10. The working system according to claim 1, wherein the floating structure has a wind power generation device, wind conditions observation equipment, a solar power generation device, lighting equipment, or radio communication equipment arranged above the column section.

11. A floating type floating structure comprising:

a column section whose peripheral surface is located at a waterline when the floating structure is floating;

a ballast section arranged below the column section; and

a flange section arranged at an intermediate portion of the column section,

wherein the flange section constitutes an engagement section for securing the floating structure in a floating state to a working ship.

12. The floating structure according to claim 11, wherein the column section is slenderer than the ballast section.

13. The floating structure according to claim 11, wherein the ballast section has a ballast tank to and from which water can be supplied and discharged.

14. The floating structure according to claim 11, wherein the flange section is configured so as to be attachable and detachable.

15. The floating structure according to claim 11, wherein the floating structure is a spar type floating body.

16. The floating structure according to claim 11, wherein the floating structure has a wind power generation device, wind conditions observation equipment, a solar power generation device, lighting equipment, or radio communication equipment arranged above the column section.

17. A working ship for performing at least installation or maintenance of a floating type floating structure, comprising:

a gripping section capable of engaging with the floating structure; and

a raising/lowering device capable of adjusting height of the gripping section from a water surface,

wherein the gripping section is raised relative to the water surface by the raising/lowering device to secure the floating structure in a floating state to the gripping section.

18. The working ship according to claim 17, wherein the raising/lowering device is a ballast adjusting device or jack capable of raising and lowering the gripping section together with the working ship.

19. The working ship according to claim 17, wherein:

the floating structure has a ballast tank to and from which water can be supplied and discharged, and

the working ship includes a controller configured to control the supply and discharge of water to and from the ballast tank, and a monitor configured to monitor posture of the floating structure.

20. The working ship according to claim 17, wherein the floating structure includes a column section whose peripheral surface is located at a waterline when the floating structure is floating, and the gripping section has a pronged unit with a recess corresponding in shape to a circumferential half of the peripheral surface of the column section and is arranged at a bow of the working ship.

21. The working ship according to claim 17, wherein the gripping section has an elastic member arranged at a portion thereof where the gripping section comes into contact with the floating structure, or a supporting member configured to restrict horizontal movement of the floating structure.

22. A working method for performing work including at least installation or maintenance of a floating type floating structure on water, comprising:

an engaging process of engaging a working ship with part of the floating structure;

a securing process of securing the floating structure to the working ship by raising or lowering the floating structure or the working ship; and

a working process of carrying out the work with respect to the floating structure.

23. The working method according to claim 22, further comprising:

a releasing process of releasing linkage between the floating structure and the working ship by raising or lowering the floating structure or the working ship; and

a retreat process of releasing engagement between the floating structure and the working ship by detaching the working ship from the floating structure.

CLAIMS

1. A working system comprising:

a floating type floating structure; and

a working ship configured to perform at least installation or maintenance of the floating structure, wherein:

the floating structure includes a column section whose peripheral surface is located at a waterline when the floating structure is floating, a ballast section arranged below the column section, and a flange section arranged at an intermediate portion of the column section,

the working ship includes a gripping section capable of engaging with the flange section at the column section,

the floating structure or the working ship includes a raising/lowering device configured to raise and lower the floating structure or the working ship,

the gripping section has a pronged unit with a recess corresponding in shape to a circumferential half of the peripheral surface of the column section, and

with the gripping section of the working ship engaged with the column under the flange section of the floating structure in a floating state, the floating structure or the working ship is raised or lowered such that weight of the floating structure is borne by the gripping section via lower surface of the flange section, to secure the floating structure to the working ship.

2. The working system according to claim 1, wherein the raising/lowering device is a ballast adjusting device provided in the ballast section of the floating structure, or a ballast adjusting device provided in the working ship, or a jack capable of raising and lowering the gripping section together with the working ship.

3. The working system according to claim 1, wherein the column section is slenderer than the ballast section.

4. The working system according to claim 1, wherein the ballast section has a ballast tank to and from which water can be supplied and discharged, and water is supplied to and discharged from the ballast tank in accordance with lowering and raising by the raising/lowering device.

5. The working system according to claim 4, wherein the working ship includes a controller configured to control the supply and discharge of water to and from the ballast tank, and a monitor configured to monitor posture of the floating structure.

6. The working system according to claim 1, wherein the gripping section has an elastic member arranged at a portion thereof where the gripping section comes into contact with the floating structure, or a supporting member configured to restrict horizontal movement of the flange section.

7. The working system according to claim 1, wherein the flange section is configured so as to be attachable and detachable.

8. The working system according to claim 1, wherein the floating structure is a spar type floating body.

9. The working system according to claim 1, wherein the floating structure has a wind power generation device, wind conditions observation equipment, a solar power generation device, lighting equipment, or radio communication equipment arranged above the column section.

10. A working ship for performing at least installation or maintenance of a floating type floating structure, the floating structure including a column section whose peripheral surface is located at a waterline when the floating structure is floating, and a flange

section arranged at an intermediate portion of the column section, the working ship comprising:

a gripping section capable of engaging with the floating structure at the column section; and

a raising/lowering device capable of adjusting height of the gripping section from a water surface,

wherein the gripping section has a pronged unit with a recess corresponding in shape to a circumferential half of the peripheral surface of the column section, and

with the gripping section of the working ship engaged with the column under the flange section of the floating structure in a floating state, the gripping section is raised relative to the water surface by the raising/lowering device, such that weight of the floating structure is borne by the gripping section via lower surface of the flange section, to secure the floating structure in a floating state to the gripping section.

11. The working ship according to claim 10, wherein the raising/lowering device is a ballast adjusting device or jack capable of raising and lowering the gripping section together with the working ship.

12. The working ship according to claim 10, wherein:

the floating structure has a ballast tank to and from which water can be supplied and discharged, and

the working ship includes a controller configured to control the supply and discharge of water to and from the ballast tank, and a monitor configured to monitor posture of the floating structure.

13. The working ship according to claim 10, wherein the gripping section has an elastic member arranged at a portion thereof where the gripping section comes into contact with the floating structure, or a supporting member configured to restrict horizontal movement of the floating

structure.

14. A working method for performing work including at least installation or maintenance of a floating type floating structure on water, the floating structure including a column section whose peripheral surface is located at a waterline when the floating structure is floating, and a flange section arranged at an intermediate portion of the column section, the working method comprising:

an engaging process of engaging the gripping section of a working ship with the column under the flange section of the floating structure in a floating state;

a securing process of securing the floating structure to the working ship by raising or lowering the floating structure or the working ship such that weight of the floating structure is borne by the gripping section via lower surface of the flange section; and

a working process of carrying out the work with respect to the floating structure.

15. The working method according to claim 14, further comprising:

a releasing process of releasing linkage between the floating structure and the working ship by raising or lowering the floating structure or the working ship; and

a retreat process of releasing engagement between the floating structure and the working ship by detaching the working ship from the floating structure.