CLAIMS

1. An undersea mining base arranged undersea and erected on a seabed, the undersea mining base mining seabed minerals while forming a bottomed hole in a seabed ore deposit, and collecting the mined seabed minerals from an inside of the bottomed hole, the undersea mining base comprising:

a seabed mineral mining device configured to form the bottomed hole in the seabed ore deposit;

a platform equipped with the seabed mineral mining device; and

a chimney detection unit configured to detect at least one chimney on the seabed ore deposit;

wherein the platform includes a plurality of support legs, each of the support legs being configured to be individually relatively slidable in a Z direction via a vertical movement mechanism.

2. An undersea mining base arranged undersea and erected on a seabed, the undersea mining base mining seabed minerals while forming a bottomed hole in a seabed ore deposit, and collecting the mined seabed minerals from an inside of the bottomed hole, the undersea mining base comprising:

a seabed mineral mining device configured to form the bottomed hole in the seabed ore deposit;

a platform equipped with the seabed mineral mining device and self-movable in at least one of an X direction and a Y direction orthogonal to each other in a horizontal plane; and

a movement frame equipped on the platform and movable by a movement mechanism,

wherein the seabed mineral mining device is attached to the movement frame in such a manner as to be movable in the at least one of the X direction and the Y direction orthogonal to each other in the horizontal plane along the platform equipped with the seabed mineral mining device by driving of the movement mechanism.

3. The undersea mining base according to claim 2, wherein the platform includes an upper platform, a lower platform, and a middle frame arranged between the upper platform and the lower platform, the middle frame and the upper platform being configured to be relatively slidable in one direction via a horizontal movement mechanism, the middle frame and the lower platform being relatively slidable in an other direction orthogonal to the one direction via a horizontal movement mechanism, and each of the upper and lower platforms including a plurality of support legs, each of the support legs being individually slidable relative to its mounting at the platform in a Z direction via a vertical movement mechanism.

4. The undersea mining base according to claim 3, wherein the movement frame is equipped on one of the upper platform or the lower platform, and the seabed mineral mining device is attached to the movement frame in such a manner as to be movable in the at least one of the X direction and the

Y direction orthogonal to each other in the horizontal plane along the one of the upper platform or the lower platform by driving of the movement mechanism.

5. The undersea mining base according to claim 4, wherein the seabed mineral mining device includes a guide shell fixed to the movement frame and extending in a vertical direction, a feeding mechanism attached to an upper portion of the guide shell, and a mining device main body connected to the feeding mechanism and configured to move vertically along the guide shell by driving of the feeding mechanism.

6. The undersea mining base according to any one of claims 3 to 5, wherein each of the support legs is fixed to the movement frame via the vertical movement mechanism, wherein the vertical movement mechanism is a jack mechanism capable of sliding a respective support leg vertically and holding a slide position of the respective support leg.

7. The undersea mining base according to any one of claims 2 to 6, wherein the movement frame includes a plurality of frames combined together in such a manner as to be mutually horizontally slidable and a movement mechanism configured to mutually horizontally slide the plurality of frames.

8. The undersea mining base according to any one of claims 1, or 3 to 6, comprising a controller configured to

control at least one of the vertical movement mechanisms equipped in the platform.

9. The undersea mining base according to claim 8, further comprising a tilt sensor as an undersea posture stabilization mechanism, wherein, on a basis of output of the tilt sensor, the controller determines a degree of imbalance in a posture of the undersea mining base itself, and executes posture stabilization control for controlling the vertical movement mechanism of each support leg to maintain posture stability of the undersea mining base itself.

10. The undersea mining base according to claim 1, wherein the chimney detection unit includes an ultrasonic wave transmitting and receiving unit and a detection unit configured to detect the chimney on a basis of an echo obtained by underwater detection using an ultrasonic wave.

11. The undersea mining base according to claim 1 or 10, wherein the chimney detection unit includes an image processing unit configured to detect the chimney on the seabed ore deposit by camera or image sensor.

12. The undersea mining base according to any one of claims 1, 10 or 11, wherein a controller executes avoidance control to avoid the detected chimney.

13. The undersea mining base according to claim 12, wherein each vertical movement mechanism equipped in the platform is driven by a motor, and

the controller monitors torque of the motor configured to drive each movement mechanism, in which when a monitored torque exceeds a predetermined value, the controller determines that a corresponding movement mechanism has contacted with the chimney, and executes the avoidance control.

14. A mining base monitoring device equipped in an offshore base or a land base to monitor the undersea mining base according to any one of claims 1, or 10 to 13, the mining base monitoring device comprising a chimney monitoring unit configured to monitor the chimney on the seabed ore deposit.

15. The mining base monitoring device according to claim 14, wherein the chimney monitoring unit includes a display unit configured to display an echo image of the chimney on a monitor screen.

16. The mining base monitoring device according to claim 15, wherein the chimney monitoring unit includes a chimney information acquisition unit configured to acquire the echo image of the detected chimney and position information of the chimney, a display synthesizing unit configured to, on a basis of the acquired position information, correlate with seabed map information acquired in advance,

and superimpose and display the echo image of the chimney and a seabed map on the monitor screen, and a determination unit configured to determine a chimney to be an obstacle to the undersea mining base.

17. The mining base monitoring device according to claim 16, wherein the position information includes latitude information and longitude information.

18. The mining base monitoring device according to claim 16 or 17, wherein the position information includes depth information of the chimney.

19. The mining base monitoring device according to any one of claims 16 to 18, wherein the determination unit determines that, among a plurality of chimneys displayed on the monitor screen, a chimney closest to the undersea mining base is the chimney to be the obstacle, on a basis of a moving direction of the undersea mining base.

20. The mining base monitoring device according to any one of claims 16 to 19, wherein the display synthesizing unit moves the seabed map and the echo image of the chimney superimposed and displayed on the monitor screen, in accordance with movement of the undersea mining base.

21. A method for avoiding a chimney on a seabed ore deposit, which is a method for avoiding interference between

a work device used on a seabed ore deposit and configured to perform work necessary to mine while self-travelling on a seabed and a chimney on the seabed ore deposit, the method comprising:

detecting the chimney on the seabed ore deposit on a basis of an echo obtained by underwater detection through transmission and reception of an ultrasonic wave; and

avoiding the interference between the work device and the chimney on a basis of position information of the chimney obtained at the detecting.