CLAIMS

What is claimed is:

1. A sand discharge system for continuous discharging sand from a sand-loaded transportation ship, comprising:

one or more sand discharge subsystems; wherein each of the one or more sand discharge subsystems comprises:

a water-feed module for providing water to dilute the superficial sand layer of sand in the sand-loaded transportation ship;

a sand-water extraction module for mixing the water from the water-feed module with the superficial sand layer and extracting the sand-water mixture so as to export the sand-water mixture for transportation; and

a sand-water transportation module for pressuring the sand-water mixture exported from the sand-water extraction module and transporting the sand-water mixture into a designated area, wherein the sand-water transportation module is in liquid communication with the sand-water extraction module; ~~and~~

a platform for providing support for the one or more sand discharge subsystems; wherein the one or more sand discharge subsystems are installed on the platform to form the sand discharge system; and~~.~~

~~2. The sand discharge system of claim 1, further comprising:~~

a convey module for moving the sand-water extraction module between the platform and the sand-loaded transportation ship;

a control module for controlling the operation of the sand discharge system; and

a power supply for providing power to the sand discharge system.

~~3~~2. The sand discharge system of claim 1, wherein the platform is a ship, a barge or a pier; and wherein one or more subsystems are disposed on the platform equally spaced.

~~4~~3. The sand discharge system of claim 1, wherein the water-feed module comprises:

a water-feed pump for pumping water from a water source to the sand cabin of the sand-loaded transportation ship;

a frequency conversion controller for controlling the pumping rate of the water feed pump; and

a water pipeline being in liquid communication with the outlet of the water feed pump for transporting water to the sand cabin of the sand-loaded transportation ship.

~~5~~4. The sand discharge system of claim 4, wherein the water-feed pump is an axially split pump.

~~6~~5. The sand discharge system of claim 1, wherein the sand-water extraction module comprises:

one or more sand-water extraction pumps for mixing water with sand and extracting sand-water mixture;

a frequency conversion controller for controlling the exporting rate of the one or more sand-water extraction pumps; and

a sand-water connection pipeline being in liquid communication with the outlets of the one or more sand-water extraction pumps for exporting the sand-water mixture to the sand-water transportation module.

~~7~~6. The sand discharge system of claim ~~6~~5, wherein the sand-water extraction pump is a high efficiency diving sand and slurry pump.

~~8~~7. The sand discharge system of claim 1, wherein the sand-water transportation module comprises:

a pressure pump for increasing the pressure of the sand-water mixture for long distance transportation;

a frequency conversion controller for controlling the pressure of the pressure pump; and

a long-distance sand-water transportation pipeline being in liquid communication with the pressure pump for transporting the pressured sand-water mixture.

~~9~~8. The sand discharge system of claim 8, wherein the pressure pump is a high efficient centrifugal slurry pump.

~~10~~9. A method for continuous and long-distanced discharge of sand from a sand-loaded transportation ship, said method comprising:

providing a water-feed module for providing water to dilute the superficial sand layer of sand in the sand-loaded transportation ship;

providing a sand-water extraction module for mixing the water from the water-feed module with the superficial sand layer and extracting the sand-water mixture so as to export the sand-water mixture for transportation; ~~and~~

providing a sand-water transportation module for pressuring the sand-water mixture exported from the sand-water extraction module and transporting the sand-water mixture into a designated area, wherein the sand-water transportation module is in liquid communication with the sand-water extraction module, wherein the water-feed module, the sand-water extraction module and the sand-water transportation module forms a sand discharge subsystem;

providing a platform for supporting the sand discharge subsystem; and

providing a convey module for moving the sand discharge subsystem between the platform and the sand-loaded transportation ship.

~~11~~10. The method of claim ~~11~~9, wherein the water-feed module comprises:

a water-feed pump for pumping water from a water source to the sand cabin of the sand-loaded transportation ship;

a frequency conversion controller for controlling the pumping rate of the water feed pump; and

a water pipeline being in liquid communication with the outlet of the water feed pump for transporting water to the sand cabin of the sand-loaded transportation ship.

~~12~~11. The method of claim ~~11~~9, wherein the water-feed pump is an axially split pump.

~~13~~12. The method of claim ~~10~~9, wherein the sand-water extraction module comprises:

one or more sand-water extraction pumps for mixing water with sand and extracting sand-water mixture;

a frequency conversion controller for controlling the exporting rate of the one or more sand-water extraction pumps; and

a sand-water connection pipeline being in liquid communication with the outlets of the one or more sand-water extraction pumps for exporting the sand-water mixture to the sand-water transportation module.

~~14~~13. The method of claim ~~13~~12, wherein the sand-water extraction pump is a high efficiency diving sand and slurry pump.

~~15~~14. The method of claim ~~10~~9, wherein the sand-water transportation module comprises:

a pressure pump for increasing the pressure of the sand-water mixture for long distance transportation;

a frequency conversion controller for controlling the pressure of the pressure pump; and

a long-distance sand-water transportation pipeline being in liquid communication with the pressure pump for transporting the pressured sand-water mixture.

~~16~~15. The method of claim ~~15~~14, wherein the pressured pump is a high efficient centrifugal slurry pump.