【CLAIMS】

~~【Claim 1】~~

1. A long distance dredged soil transport system using an electromagnetic field and tornado eddy current technique, the system comprising:

a pump module including a pump for generating a compressed air and generating a plug flow flowing by dividing an inner state of a pipeline to a gaseous unit and a liquefied unit by introducing the generated compressed air into the pipeline by being interlinked to one lateral surface of the pipeline;

a pipe module wound with a coil configured to apply an electromagnetic wave to the liquefied unit and including a plurality of pipelines;

database stored with flow information on flow velocity and flow form in response to physical properties of liquefied unit; and

a control module communicating with the pipe module, the pump module and the database wiredly and wirelessly and applying, to the coil, a current of waveform matching to a flow waveform of the liquefied unit transported inside the pipeline[[~~.~~]]; and

wherein the pump module includes a pump pressure sensor unit configured to grasp a stroke period of the pump and to convert the grasped stroke period of the pump to a voltage signal, and the pipe module includes a pipe pressure sensor unit configured to grasp flow velocity and waveform of the liquefied unit transported into the pipeline and to convert the grasped flow velocity and the waveform to a pressure signal.

~~【Claim 2】~~

~~The system of claim 1, wherein the pump module includes a pump pressure sensor unit configured to grasp a stroke period of the pump and to convert the grasped stroke period of the pump to a voltage signal, and the pipe module includes a pipe pressure sensor unit configured to grasp flow velocity and waveform of the liquefied unit transported into the pipeline and to convert the grasped flow velocity and the waveform to a pressure signal.~~

~~【Claim 3】~~

2. The system of claim 1~~2~~, wherein the pipe pressure sensor unit includes a first pressure sensor and a second pressure sensor each installed by being spaced apart at a predetermined distance.

~~【Claim 4】~~

3. The system of claim 1~~2~~, wherein the control module includes a central computation unit configured to generate a flow signal for controlling transport of the liquefied unit by comparing the flow velocity and waveform in response to the

physical properties of the liquefied unit received from the database with an actual flow velocity and waveform of the liquefied unit transported into the pipeline, a function generation unit configured to convert the flow signal using a function by receiving the flow signal from the central computation unit, a pulse generation unit configured to convert the voltage signal received from the pipe pressure sensor unit to a pulse signal using the function by receiving the voltage signal received from the pipe pressure sensor unit and by receiving a function from the function generation unit, and a bridge circuit unit configured to receive the pulse signal from the pulse generation unit and to convert a current received from outside to a current having the pulse signal and to apply the converted current to the coil.

~~【Claim 5】~~

4. The system of claim 3~~4~~, wherein the pulse generation unit includes a pulse detection unit configured to detect an amplitude and a period of a pulse of the voltage signal by receiving the voltage signal from the pipe pressure sensor unit, an integral circuit unit configured to convert a pressure waveform energy proportional to a pulse waveform period to a voltage signal by receiving the amplitude and size detected by the pulse detection unit, a PWM (Pulse Width Modulation) generation unit configured to generate a PWM period pulse in response to a pulse waveform period by receiving a voltage signal from the integral circuit unit, and a pulse generation unit configured to convert the PWM period pulse received from the PWM generation unit using the function received from the function generation unit, and to convert the converted PWM period pulse to a gate voltage of the bridge circuit unit.

~~【Claim 6】~~

5. The system of claim 2~~3~~, further comprising a state measurement unit configured to monitor flow velocity and pressure change of the liquefied unit inside the pipeline.

~~【Claim 7】~~

6. The system of claim 5~~6~~, wherein the state measurement unit monitors the flow velocity and pressure change of flow inside the liquefied unit using the following equation:

<Equation>

$$\nabla p = f * \frac{L}{D} * \frac{\rho}{2} * v^2$$

where, f is a friction factor, L is a distance between first pressure sensor and second pressure sensor, D is a diameter of pipeline, ρ is a density of liquefied unit, and v is a flow velocity obtained through pump pressure sensor.

~~【Claim 8】~~

7. The system of claim 1, wherein the flow information of the liquefied unit stored in the database is updatable, additionable, changeable and deletable.

~~【Claim 9】~~

8. A control method of dredged soil transport system including a pipe module configured to transport dredged soils, a pump module, database and a control module, the method comprising:

a first step of detecting flow velocity and waveform of a liquefied unit using a pressure sensor formed on the pipe module and the pump module relative to the liquefied unit of plug flow flowing by being divided to a gasified state and the liquefied unit generated by the pump module;

subsequently, a second step of receiving, by the control module, the flow velocity and waveform in response to physical properties from the flow velocity, the waveform and the database of the liquefied unit detected from the first step;

subsequently, a third step of generating a current of waveform matching to flow waveform of the liquefied unit transported inside the pipeline by comparing the flow velocity and waveform in response to the physical properties of liquefied unit received from the database with the flow velocity and waveform of the liquefied unit detected from the first step; and subsequently, a fourth step of applying the generated current to a coil wound on the pipeline of the pipe module.

~~【Claim 10】~~

9. The control method of claim 8~~9~~, wherein the third step includes a 3-1 step of generating a flow signal for controlling transport of the liquefied unit based on an actual flow velocity and waveform of the liquefied unit detected from the first step, subsequently, a 3-2 step of generating a function based on the flow velocity and waveform in response to the physical properties of the liquefied unit received from the database, subsequently, a 3-3 step of converting the flow signal to a pulse signal using the function; and subsequently, a 3-4 step of converting a current received from outside to a current having the pulse signal.