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CN 110045144 A
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DRAWINGS

1/5

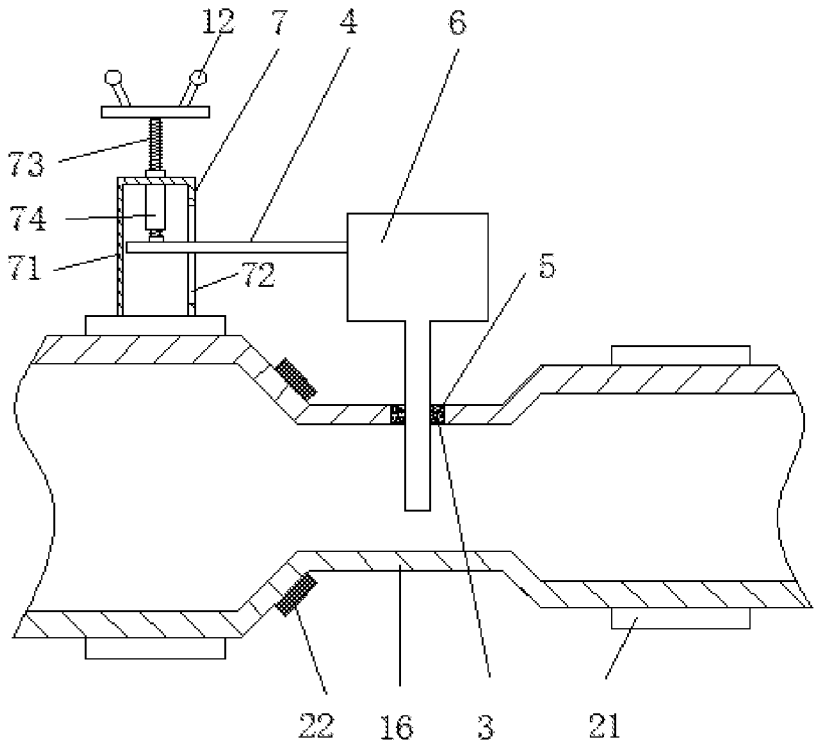

FIG. 1

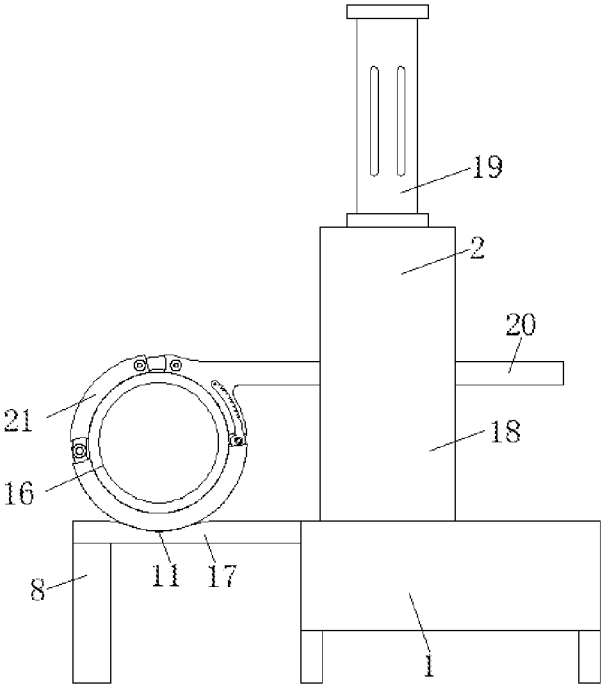

FIG. 2

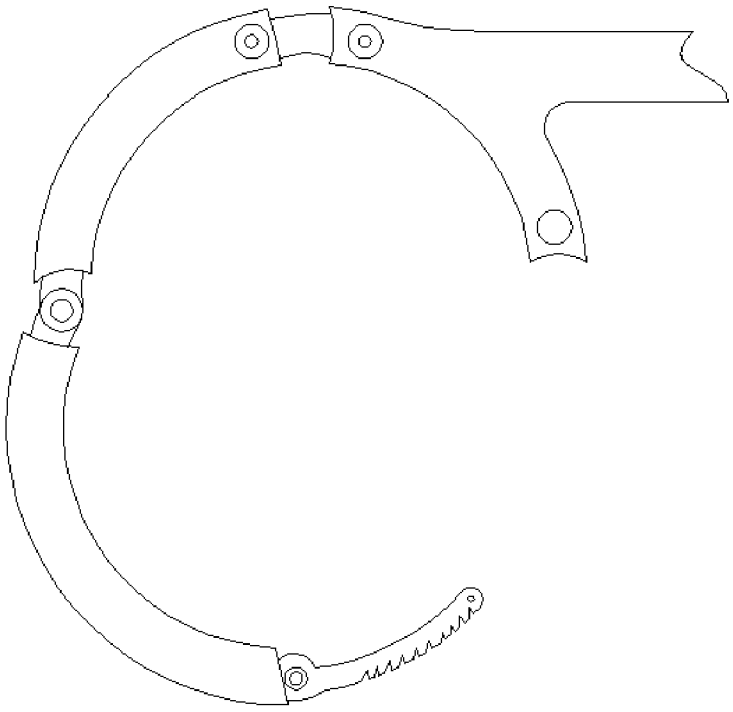

FIG. 3

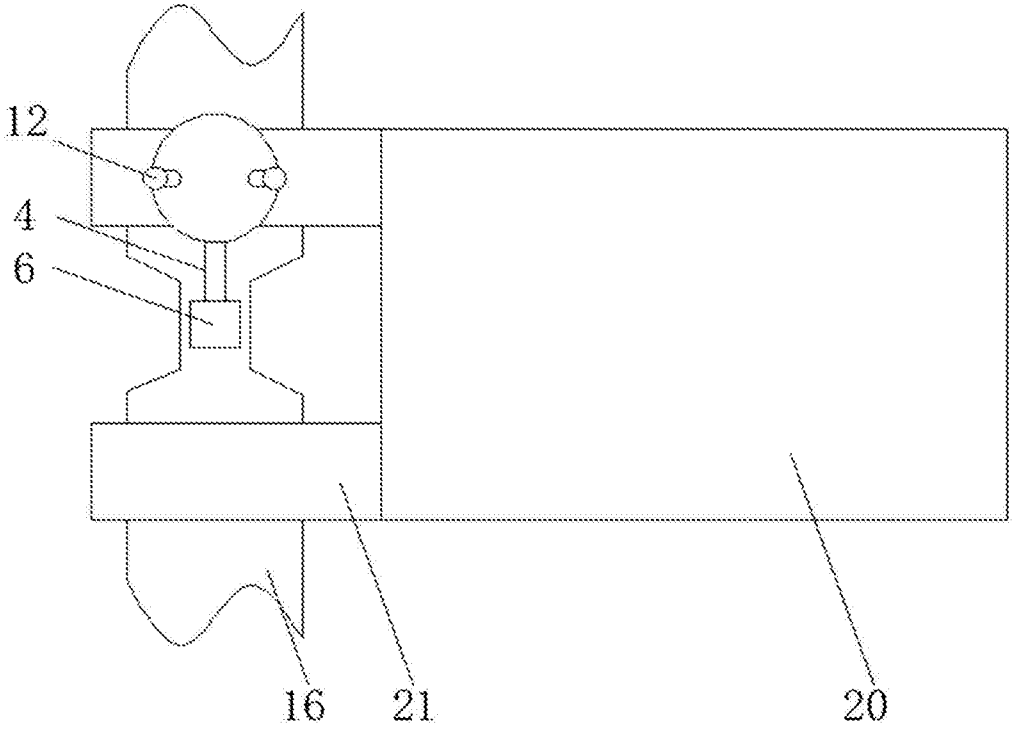

FIG. 4

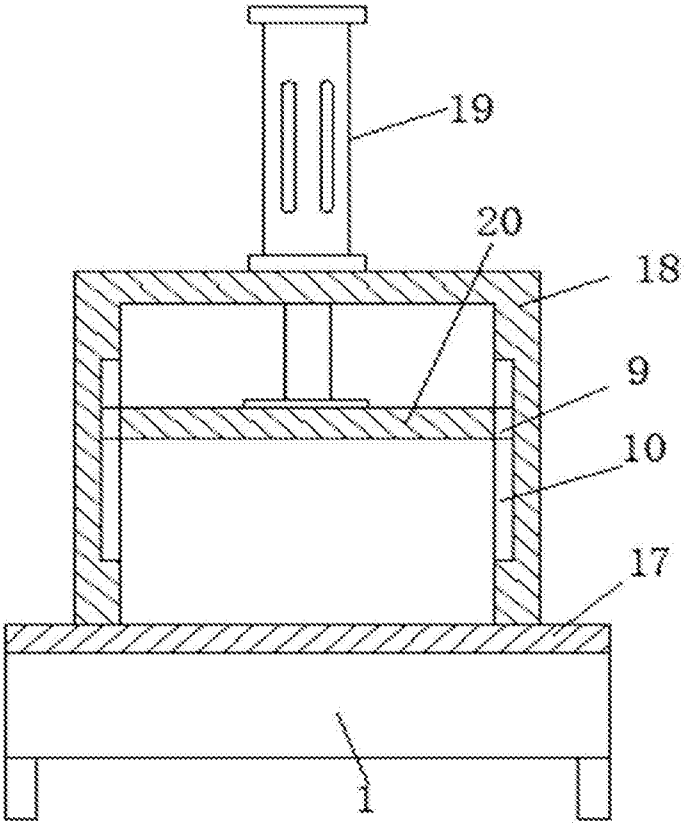

FIG. 5

PRESSURE TESTING MACHINE FOR FLUID IN CAVITATION GENERATOR AND TESTING METHOD USING SAME

TECHNICAL FIELD

The present disclosure relates to the technical field of fluid cavitation pressure testing, and in particular to a pressure testing machine for fluid in a cavitation generator and a testing method using the same.

BACKGROUND

Performance of a hydrodynamic cavitation generator applied to the flotation of deep-sea minerals containing valuable polymetallic nodules is closely associated with a cavitation degree therein. The cavitation refers to the process of formation, growth and collapse of vapor or gas cavities (bubbles) in a liquid or on a liquid-solid interface when the local pressure in the liquid drops. To research cavitation of a multiphase flow in the cavitation generator, it is necessary to test a pressure of the internal flow field. The Chinese patent No. CN 200993582 provides a pipeline fluid detection device, including a measuring pipe, an elastic pipe, an outer sleeve, a weight detection mechanism, compensation regulation mechanisms, an electrically controlled measurement system, and the like. Two ends of the measuring pipe are connected to the elastic pipe. The other ends of left and right fixed pipes to which the elastic pipe is connected are respectively connected to an external inlet pipeline and outlet pipeline. The measuring pipe is nested in the outer sleeve. Two horizontal sides of one end of the measuring pipe are connected to the outer sleeve through a bearing. The other end of the measuring pipe is connected to the weight detection mechanism through a pull rod. The measuring pipe is of a suspended structure. The compensation regulation mechanisms are separately provided for measuring a pressure of chilled water between the measuring pipe and the outer sleeve, for measuring a temperature of the weight detection mechanism, and for measuring a pressure of a pipeline fluid, and therefore, the device can make compensations for various emerging factors to ensure accuracy and reliability in measurement.

When the pipeline fluid detection device is used, the outer sleeve is sleeved on the measuring pipe, and a detection module is provided on the outer sleeve. Due to a limited size of the sleeve, the detection method has a limited range. Moreover, when a detected object has a variable diameter, the sleeve cannot effectively clamp different diameters and thus has a restricted application range.

SUMMARY

In view of problems mentioned in the background, an objective of the present disclosure is to

provide a pressure testing machine for fluid in a cavitation generator. The present disclosure can realize accurate location and multi-point measurement of pressures of the fluid in the cavitation generator, break through the limitation of the clamping mechanism of the existing detector on a clamping size to the variable-diameter pipe fitting with a clamping unit, and control a cavitation intensity in the flow field by adjusting the temperature through a flexible heating belt, thereby providing multiple research conditions for pressure measurement.

The present disclosure achieves the above technical objective through the following technical means.

A cavitation generator fluid pressure testing machine is provided, including a base, and a cavitation generator body that is adapted to contain fluid having a pressure which is to be tested; where a bracket is provided on the base; a clamping fixture mechanism is provided on the bracket; the clamping fixture mechanism may move up and down along a chute in the bracket; one end of the clamping fixture mechanism is provided with a clamping unit; the clamping unit is configured to clamp and support the cavitation generator body; a lifting mechanism is provided on the clamping unit; an output end of the lifting mechanism is connected to a lifting plate; the lifting plate is connected to a pressure sensor; a sensing end of the pressure sensor is provided in the cavitation generator body; and, when in use, by moving the lifting plate up and down, the position of the pressure sensor in the cavitation generator body may be adjusted, thereby detecting pressures of the fluid at different positions;

further characterized in that the clamping unit is a telescopic clamp, and the telescopic clamp is configured to clamp the cavitation generator body of different diameters;

and wherein an output end of the pressure sensor extends into the cavitation generator body from an opening for detection, whereby the pressure distribution information of a flow field in the cavitation generator body can be measured at different detection positions.

Further, a periphery of the cavitation generator body is provided with a flexible heating belt, and the flexible heating belt is configured, in use, to heat the fluid in the cavitation generator body.

Further, the clamping fixture mechanism includes a driving plate, the driving plate is fixedly connected to an output end of a hydraulic mechanism, the driving plate slides up and down along the chute in the bracket, and one end of the driving plate is provided with the clamping unit.

Further, the cavitation generator body is provided on a placement plate, an arc groove is formed in the placement plate, and the arc groove is attached to an outer sidewall of the cavitation generator body.

Further, the lifting mechanism drives the lifting plate to move up and down by converting a helical motion into a linear motion.

Further, the lifting mechanism includes a sleeve, a screw, and a threaded insert; a movable notch is formed on one side of the sleeve; the screw includes one end provided outside the sleeve, and the other end extending into the sleeve; a tail end of a screw segment extending into the sleeve is provided with the lifting plate; the screw segment extending into the sleeve is threadedly connected to the threaded insert; and by rotating the screw, the lifting plate may move up and down.

Further, graduations are arranged along the movable notch.

Further, the chute in the bracket is a dovetail groove, two ends of the driving plate are each provided with a dovetail member, and the dovetail member is in sliding fit with the dovetail groove.

In a further aspect of the present invention, a testing method using the above cavitation generator fluid pressure testing machine is provided, the method including the following steps:

providing the cavitation generator body on the placement plate, and moving down the clamping unit to clamp and support the cavitation generator body;

enabling the lifting mechanism to drive the lifting plate to move up and down, thereby testing pressures of the fluid at different positions of the cavitation generator body; and/or

providing the flexible heating belt on the periphery of the cavitation generator body to control a temperature of the fluid in the cavitation generator body, thereby changing a saturation vapor pressure of the fluid.

Compared with the prior art, the present disclosure has the following beneficial effects.

1. The present disclosure circumferentially clamps the to-be-tested cavitation generator body through the clamping fixture mechanism in a wrap-around manner, and can adaptively clamp parts of different diameters on the cavitation generator through a telescopic function of the telescopic clamp.

2. According to the present disclosure, the sensor part moves up and down through the lifting mechanism, and the screw in the lifting mechanism moves up and down through rotation of a twisting member, thereby driving the pressure sensor, to which the lifting plate is connected, to move up and down in a vertical direction. A graduation ruler attached to an outer wall of the lifting mechanism can locate a position of the lifting plate, and can accurately control a position of the pressure sensor in the cavitation generator. An output end of the pressure sensor extends into the cavitation generator from an opening for detection, and pressure distribution information of a flow field in the cavitation generator can be measured at different detection positions. The detection method can quickly test the pressures of the fluid in the cavitation generator, expand a pressure detection range, and has a strong adaptability.

3. By paving the flexible heating belt on an outer wall of a head tapering segment of the cavitation generator, the present disclosure controls a temperature of the multiphase flow in the cavitation generator at 1-99°C to obtain flow fields at different cavitation degrees. Without

disassembly and replacement of the cavitation generator, the present disclosure provides multiple pressure measurement conditions at different cavitation degrees, and facilitates research on a pressure field in the cavitation generator.

4. By providing a support leg at an end of the placement plate away from the base, a heavy cavitation generator can be supported by the support leg secondarily, to improve the load-carrying capacity, which can realize the stable supporting effect, and prevent the damage of the heavy cavitation generator to the placement plate.

5. With the dovetail member and the dovetail groove, the moving driving plate is prone to inclination due to a weight of the telescopic clamp. By limiting and guiding the driving plate with the dovetail member and the dovetail groove, in case of a large pressure at one end, the driving plate can be connected to the bracket more firmly under the guidance of the dovetail member and the dovetail groove, and thus the driving plate and the telescopic clamp can better clamp the cavitation generator.

6. The arc groove in the surface of the placement plate effectively limits the cavitation generator. When the cavitation generator is fixed by the clamping fixture mechanism, the placement plate having the arc groove can limit the cavitation generator desirably and keep the cavitation generator relatively stable in cooperation with the telescopic clamp.

7. The present disclosure accurately locates the position of the pressure sensor with the graduation ruler and can realize multi-point pressure measurement. With the heating belt paved on the head of the cavitation generator, the present disclosure can provide multiple cavitation conditions. The present disclosure can effectively clamp a variable-diameter pipe fitting with the arc telescopic clamp.

8. The present disclosure wraps and clamps the to-be-tested cavitation generator body through the clamping fixture mechanism and the telescopic clamp, which can adaptively clamp the cavitation generator of different diameters. The circumferential wrapping and clamping can provide a uniform and stable clamping force to make the cavitation generator stable. The present disclosure adjusts the position of the sensor through the lifting plate linkage with the lifting mechanism, and can accurately locate a measuring point according to the graduations on the outer wall of the lifting mechanism. Since the flexible heating belt is paved on the head tapering segment of the cavitation generator, the cavitation intensity of the internal fluid can be changed by adjusting the temperature of the heating belt, which provides multiple conditions for pressure detection in the pipe. The pressure testing machine can test the pressures of the fluid in the cavitation generator quickly and conveniently, with a strong adaptability. Meanwhile, the pressure testing machine can adjust the cavitation condition, and measure cavitation pressures under multiple conditions without disassembly and replacement of the cavitation generator, thereby improving the operation

efficiency.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a structural sectional view of a pressure testing machine for fluid in a cavitation generator according to the present disclosure.

FIG. 2 is a left view of a base and a lifting mechanism according to the present disclosure.

FIG. 3 is a structural view of a telescopic clamp in FIG. 2.

FIG. 4 is a top view of a clamping fixture mechanism according to the present disclosure.

FIG. 5 is a left sectional view of a connecting structure for a dovetail member and a dovetail groove according to the present disclosure.

Reference numerals:

1-base, 2-clamping fixture mechanism, 3-opening, 4-lifting plate, 5-sealing ring, 6-pressure sensor, 7-lifting mechanism, 71-sleeve, 72-movable notch, 73-screw, 74-threaded insert, 8-support leg, 9-dovetail member, 10-dovetail groove, 11-arc groove, 12-twisting member, 16-to-be-tested cavitation generator body, 17-placement plate, 18-bracket, 19-cylinder, 20-driving plate, 21-clamping unit, and 22-flexible heating belt.

DETAILED DESCRIPTION OF THE EMBODIMENTS

The embodiments of the present disclosure are described below in detail. Examples of the embodiments are shown in the drawings. The same or similar numerals represent the same or similar elements or elements having the same or similar functions throughout the specification. The embodiments described below with reference to the drawings are illustrative, which are merely intended to explain the present disclosure, rather than to limit the present disclosure.

It should be understood that, in the description of the present disclosure, the terms such as "central", "longitudinal", "transverse", "length", "width", "thickness", "upper", "lower", "axial", "radial", "vertical", "horizontal", "inner", and "outer' are intended to indicate orientations or positional relations shown in the drawings. It should be noted that these terms are merely intended to facilitate a simple description of the present disclosure, rather than to indicate or imply that the mentioned apparatus or elements must have the specific orientation or be constructed and operated in the specific orientation. Therefore, these terms may not be construed as a limitation to the present disclosure. Moreover, the terms such as "first" and "second" are used only for the purpose of description and should not be construed as indicating or implying a relative importance, or implicitly indicating a quantity of indicated technical features. Thus, features defined with "first" and "second" may explicitly or implicitly include one or more of the features. In the description of the present disclosure, "a plurality of" means two or more, unless otherwise specifically defined.

In the present disclosure, unless otherwise clearly specified and limited, the terms "installed", "connected with", "connected to", and "fixed" should be understood in a board sense. For example, the connection may be a fixed connection, a detachable connection or an integrated connection, may be a mechanical connection or an electrical connection, may be a direct connection or an indirect connection with use of an intermediate medium, or may be intercommunication between two components. Those of ordinary skill in the art may understand specific meanings of the above terms in the present disclosure based on a specific situation.

A pressure testing machine for fluid in a cavitation generator includes a base 1. A bracket 18 is provided on the base 1. A clamping fixture mechanism 2 is provided on the bracket 18. The clamping fixture mechanism 2 may move up and down along a chute in the bracket 18. One end of the clamping fixture mechanism 2 is provided with a clamping unit 21. The clamping unit 21 is configured to clamp and support a to-be-tested cavitation generator body 16. A lifting mechanism 7 is provided on the clamping unit. An output end of the lifting mechanism 7 is connected to a lifting plate 4. The lifting plate 4 is connected to a pressure sensor 6. A sensing end of the pressure sensor 6 is provided in the to-be-tested cavitation generator body 16. By moving the lifting plate 4 up and down, a position of the pressure sensor 6 in the to-be-tested cavitation generator body 16 may be adjusted, thereby detecting pressures of fluid at different positions.

A periphery of the to-be-tested cavitation generator body 16 is provided with a flexible heating belt 22. The flexible heating belt 22 is configured to heat the fluid in the to-be-tested cavitation generator body 16.

The clamping unit 21 is a telescopic clamp. The telescopic clamp may be configured to clamp the to-be-tested cavitation generator body 16 of different diameters.

The clamping fixture mechanism 2 includes a driving plate 20. The driving plate 20 is fixedly connected to an output end of a hydraulic mechanism. The driving plate 20 slides up and down along the chute in the bracket 18. One end of the driving plate 20 is provided with the clamping unit.

The to-be-tested cavitation generator body 16 is provided on a placement plate 17. An arc groove 11 is formed in the placement plate 17. The arc groove 11 is attached to an outer sidewall of the to-be-tested cavitation generator body 16.

The lifting mechanism 7 drives the lifting plate 4 to move up and down by converting a helical motion into a linear motion.

The lifting mechanism 7 includes a sleeve 71, a screw 73, and a threaded insert 74. A movable notch 72 is formed on one side of the sleeve 71. The screw 73 includes one end provided outside the sleeve 71, and the other end extending into the sleeve 71. A tail end of a screw 73 segment extending into the sleeve 71 is provided with the lifting plate 4. The screw 73 segment extending

into the sleeve 71 is threadedly connected to the threaded insert 74. By rotating the screw 73, the lifting plate 4 may move up and down.

Graduations are arranged along the movable notch 72.

The chute in the bracket 18 is a dovetail groove 10. Two ends of the driving plate 20 are each provided with a dovetail member 9. The dovetail member 9 is in sliding fit with the dovetail groove 10.

A testing method using the pressure testing machine for the fluid in the cavitation generator includes the following steps.

The to-be-tested cavitation generator body 16 is provided on the placement plate 17. The clamping unit 21 is moved down to clamp and support the to-be-tested cavitation generator body 16.

The lifting mechanism 7 drives the lifting plate 4 to move up and down, thereby testing pressures of the fluid at different positions of the to-be-tested cavitation generator body 16.

Or/and, the flexible heating belt 22 is provided on the periphery of the to-be-tested cavitation generator body 16 to control a temperature of the fluid in the to-be-tested cavitation generator body 16, thereby changing a pressure of the fluid.

Referring to FIG. 1 to FIG. 4, a pressure testing machine for fluid in a cavitation generator includes a base 1. A clamping fixture mechanism 2 is provided on a top of the base 1. The clamping fixture mechanism 2 includes a placement plate 17 fixedly connected to a left side of the base 1. An arc groove 11 is formed in a surface of the placement plate 17. A bottom of a to-be-tested cavitation generator body 16 is attached to the arc groove 11 of the placement plate 17. The top of the base 1 is fixedly connected to a bracket 18. A top of the bracket 18 is fixedly connected to a cylinder 19. An inner side of the bracket 18 is slidably connected to a driving plate 20. An output end of the cylinder 19 is fixedly connected to the driving plate 20. A left side of the driving plate 20 is fixedly connected to a telescopic clamp. The telescopic clamp firmly wraps around an outer wall of the to-be-tested cavitation generator body 16 to tighten and clamp the to-be-tested cavitation generator body 16. The telescopic clamp includes three arc plates connected through a hinge. A tail end of the telescopic clamp is of a zigzag structure, which can adjust the tightness after inserted into a locking sleeve to realize tightening and clamping for different diameters. A lifting mechanism is provided on a top of the telescopic clamp.

The lifting mechanism 7 is provided on a top of the to-be-tested cavitation generator body 16. The lifting mechanism 7 includes an accommodating sleeve 71 fixedly connected to the top of the telescopic clamp. A bottom of a side of the accommodating sleeve 71 close to the lifting plate 4 is provided with a movable notch 72. A graduation ruler is provided on an outer wall of the movable notch 72. A left end of the lifting plate passes through the movable notch 72 and is fixedly

connected to a screw 73 in the accommodating sleeve 71. A top of the screw 73 is fixedly connected to a twisting member 12. A surface of the screw 73 is threadedly connected to a threaded insert 74. A right end of the lifting plate 4 is fixedly connected to a pressure sensor 6. A sensing end of the pressure sensor 6 extends into a flow field through a detection opening 3 in the cavitation generator. A sealing ring 5 is provided between the opening 3 and the pressure sensor 6 so as to realize a sealing effect. A flexible heating belt 22 is paved on an outer wall of a head tapering segment of the to-be-tested cavitation generator body 16 so as to control a temperature of a multiphase flow.

Referring to FIG. 2, a bottom of an end of the placement plate 17 away from the base 1 is fixedly connected to a support leg 8. A bottom of the support leg 8 is fixedly connected to a rubber member.

By providing the support leg 8 at the end of the placement plate 17 away from the base 1, a heavy cavitation generator can be supported by the support leg 8 secondarily to improve the load-carrying capacity, which can realize the stable supporting effect, and prevent the damage of the heavy cavitation generator to the placement plate 17.

Referring to FIG. 2 and FIG. 4, a front side and a back side of the driving plate 20 are each fixedly connected to a dovetail member 9. A dovetail groove 10 cooperated with the dovetail member 9 is formed in an inner wall of the bracket 18. The dovetail member 9 is slidably connected to the dovetail groove 10.

With the dovetail member 9 and the dovetail groove 10, the moving driving plate 20 is prone to inclination due to a weight of the telescopic clamp 21. By limiting and guiding the driving plate 20 with the dovetail member 9 and the dovetail groove 10, in case of a large pressure at one end, the driving plate 20 can be connected to the bracket 18 more firmly under the guidance of the dovetail member 9 and the dovetail groove 10, and thus the driving plate 20 and the telescopic clamp 21 can better clamp the cavitation generator.

Referring to FIG. 2, a top of the placement plate 17 and a bottom of the telescopic clamp 21 are each provided with the arc groove 11. The arc groove 11 is attached to the to-be-tested cavitation generator body 16.

The arc groove 11 effectively limits the cavitation generator. When the cavitation generator is fixed by the clamping fixture mechanism 2, the placement plate 17 and the telescopic clamp each having the arc groove 11 can limit the cavitation generator desirably and keep the cavitation generator relatively stable.

Referring to FIG. 3, the top of the screw 73 is fixedly connected to the twisting member 12. The screw 73 is rotationally cooperated with a nut 74. A bottom of the screw 73 is fixedly connected to the lifting plate 4. A right side of the lifting plate 4 is fixedly connected to the pressure sensor 6. The graduation ruler is provided on the outer wall of the movable notch 72 of the lifting

mechanism. Through graduations corresponding to the lifting plate 4, the pressure sensor can be accurately located and controlled.

The top of the screw extends out of the accommodating sleeve and is fixedly connected to the twisting member. While the twisting member is rotated, the screw is driven to rotate, and the screw is cooperated with the nut, thereby implementing a motion in the vertical direction. The bottom of the screw is fixedly connected to the lifting plate, and the lifting plate is fixedly connected to the pressure sensor. While the screw moves up and down, the pressure sensor is driven to move up and down. By rotating the twisting member, the pressure sensor can be controlled to move up and down. The position of the lifting plate can be controlled through the graduation ruler at the movable notch. Consequently, the position of the sensing end of the pressure sensor in the cavitation generator is controlled and adjusted accurately, thereby realizing multi-point measurement of different measuring points of the internal flow field and obtaining complete pressure distribution information of the flow field.

Referring to FIG. 3, the flexible heating belt 22 is paved outside the head tapering segment of the cavitation generator body 16.

Preferably, the flexible heating belt wraps around the outer wall of the head tapering segment of the cavitation generator, which can control the temperature of the fluid in the pipe at 1-99°C to measure the saturation vapor pressures in different conditions. The mixed fluid has different saturation vapor pressures at different temperatures. By adjusting the temperature of the flow field, different cavitation conditions are provided without disassembly and replacement of the cavitation generator, thereby meeting requirements on pressure measurement and research of the internal flow field.

The to-be-tested cavitation generator body 16 is provided on the top of the placement plate 17. The driving plate 20 is moved down under the pushing of the cylinder 19. The driving plate 20 drives the telescopic clamp 21 to move down to clamp the to-be-tested cavitation generator body 16. The to-be-tested cavitation generator body 16 is limited by the arc groove 11. After the to-be-tested cavitation generator body is clamped firmly, the sensor is connected to the to-be-tested cavitation generator body 16. In response to connection, the part of the to-be-tested cavitation generator body 16 provided with the opening 3 is upward, and the opening 3 is aligned to the output end of the pressure sensor 6. By rotating the twisting member 12, the screw 73 is driven to move down. The screw 73 drives the lifting plate 4 to move down. The lifting plate 4 drives the pressure sensor 6 to move down. The pressure sensor 6 extends into the to-be-tested cavitation generator body 16 from the opening 3 for detection. A cavitation condition of the flow field is set by adjusting the temperature of the flexible heating belt, and thus pressures of the fluid in the cavitation generator under multiple conditions are tested quickly.

In this specification, descriptions of reference terms such as "one embodiment", "some embodiments", "an example", "a specific example" and "some examples" indicate that specific features, structures, materials or characteristics described in combination with the embodiment(s) or example(s) are included in at least one embodiment or example of the present disclosure. In this specification, the schematic representations of the above-mentioned terms do not necessarily refer to the same embodiment or example. Moreover, the described specific features, structures, materials or characteristics can be combined in any one or more embodiments or examples in a suitable manner.

Although the embodiments of the present disclosure have been illustrated and described above, it can be understood that the above embodiments are exemplary and cannot be construed as a limitation to the present disclosure. A person of ordinary skill in the art may make various changes, modifications, replacements and variations to the above embodiments without departing from the scope of the present disclosure as defined in the appended claims.

CLAIMS

WHAT IS CLAIMED IS:

1. A cavitation generator fluid pressure testing machine, comprising a base (1) and a cavitation generator body (16) wherein the cavitation generator body is adapted to contain fluid having a pressure which is to be tested; characterized in that a bracket (18) is provided on the base (1); a clamping fixture mechanism (2) is provided on the bracket (18); the clamping fixture mechanism (2) moves up and down along a chute in the bracket (18); one end of the clamping fixture mechanism (2) is provided with a clamping unit (21); and the clamping unit (21) is configured to clamp and support the cavitation generator body (16); and

a lifting mechanism (7) is provided on the clamping unit; an output end of the lifting mechanism (7) is connected to a lifting plate (4); the lifting plate (4) is connected to a pressure sensor (6); a sensing end of the pressure sensor (6) is provided in the cavitation generator body (16); and whereby in use, by moving the lifting plate (4) up and down, the position of the pressure sensor (6) in the cavitation generator body (16) is adjusted, thereby detecting pressures of the fluid at different positions;

characterized in that the clamping unit (21) is a telescopic clamp, and the telescopic clamp is configured to clamp the cavitation generator body (16) of different diameters; and

wherein an output end of the pressure sensor extends into the cavitation generator body from an opening for detection, whereby the pressure distribution information of a flow field in the cavitation generator body can be measured at different detection positions.

2. The cavitation generator fluid pressure testing machine according to claim 1, characterized in that a periphery of the cavitation generator body (16) is provided with a flexible heating belt (22), and the flexible heating belt (22) is configured, in use, to heat the fluid in the cavitation generator body (16).

3. The cavitation generator fluid pressure testing machine according to claim 1, characterized in that the clamping fixture mechanism (2) comprises a driving plate (20), the driving plate (20) is fixedly connected to an output end of a hydraulic mechanism, the driving plate (20) slides up and down along the chute in the bracket (18), and one end of the driving plate (20) is provided with the clamping unit.

4. The cavitation generator fluid pressure testing machine according to claim 1, characterized in that the cavitation generator body (16) is provided on a placement plate (17), an arc groove (11) is formed in the placement plate (17), and the arc groove (11) is attached to an outer sidewall of

the cavitation generator body (16).

5. The cavitation generator fluid pressure testing machine according to claim 1, characterized in that the lifting mechanism (7) drives the lifting plate (4) to move up and down by converting a helical motion into a linear motion.

6. The cavitation generator fluid pressure testing machine according to claim 5, characterized in that the lifting mechanism (7) comprises a sleeve (71), a screw (73), and a threaded insert (74); a movable notch (72) is formed on one side of the sleeve (71); the screw (73) comprises one end provided outside the sleeve (71), and the other end extending into the sleeve (71); a tail end of a screw (73) segment extending into the sleeve (71) is provided with the lifting plate (4); the screw (73) segment extending into the sleeve (71) is threadedly connected to the threaded insert (74); and by rotating the screw (73), the lifting plate (4) moves up and down.

7. The cavitation generator fluid pressure testing machine according to claim 6, characterized in that graduations are arranged along the movable notch (72).

8. The cavitation generator fluid pressure testing machine according to claim 1, characterized in that the chute in the bracket (18) is a dovetail groove (10), two ends of the driving plate (20) are each provided with a dovetail member (9), and the dovetail member (9) is in sliding fit with the dovetail groove (10).

9. A testing method using the cavitation generator fluid pressure testing machine according to any one of claims 1 to 8, characterized by comprising the following steps:

providing the cavitation generator body (16) on the placement plate (17), and moving down the clamping unit (21) to clamp and support the cavitation generator body (16);

enabling the lifting mechanism (7) to drive the lifting plate (4) to move up and down, thereby testing pressures of the fluid at different positions of the cavitation generator body (16); and/or

providing the flexible heating belt (22) on the periphery of the cavitation generator body (16) to control a temperature of the fluid in the cavitation generator body (16), thereby changing a pressure of the fluid.