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(54) Title: METHOD AND DRAINING DEVICE FOR DRAINING OF A DEVICE PROVIDED WITH A BOTTOM DISCHARGE

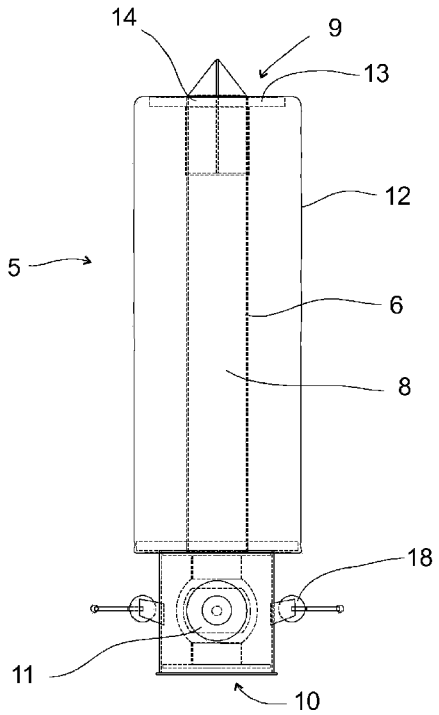


Fig.2

(57) Abstract: The invention relates a method and a draining device for draining a device (2) provided with a bottom discharge (1). The draining device (5) comprises a pipe member (6), which is intended to be brought from outside the device (2) to be drained through the bottom discharge (1), so that the pipe member (6) is partly located in the interior (7) of the device (2) to be drained. The draining device (5) comprises a channel (8). The channel (8) has a first open end (9) which, when the pipe member (6) is brought from outside the device (2) to be drained through the bottom discharge (1), so that the pipe member (6) is partly located in the interior (7) of the device (2) to be drained, is adapted to be situated in the interior (7) of the device (2) to be drained. The channel (8) has a second open end (10) which, when the pipe member (6) is brought from outside the device (2) to be drained through the bottom discharge (1), so that the pipe member (6) is partly located in the interior (7) of the device (2) to be drained, is adapted to be situated outside the device (2) to be drained.

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Method and a draining device for draining of a device provided with a bottom discharge

Background of the invention

The invention relates to a method according to the preamble of Claim 1 for draining of a device provided with a bottom discharge.

The invention also relates to a draining device according to the preamble of Claim 10 for draining of a device provided with a bottom discharge.

The invention relates to the draining of devices that are provided with bottom discharges, such as hydrometallurgical reactors, tanks, such as thickening tanks and cooling towers; to be more precise, to the draining of devices provided with bottom discharges, through the bottom discharge. In this context, draining refers to discharging the contents of the device that are in a liquid form.

A problem with devices provided with bottom discharges is that, in use, deposits form on their bottoms, which can be hard and which prevent the draining of the devices through the bottom discharge, since the deposits block the bottom discharge. One way of removing these deposits presently used is that the deposits are removed manually by entering the device and removing the deposits from the inside. This is not safe.

US 5,558,140 presents a fluid container draining device for draining fluid from a fluid container, an oil filter, in a controlled manner. The fluid container draining device has a threaded screw with a sharpened tip and a channel communicating between an opening at a forward end of the screw and a rear region of the threaded screw. When the screw is turned it will penetrate the wall of the fluid container and enter the fluid containing cavity of the fluid container. The threaded screw has a radially extending abutment surface to provide fluid tight sealing between the screw and the fluid container's walls to prevent fluid leakage. A fluid valve is positioned at the rear region of the screw to provide fluid flow control between the interior of the fluid container and outside the fluid container. The fluid valve is provided with a fitting for connection to a suction line to thereby permit fluid to be evacuated from the fluid container.

Short description of the invention

The object of the invention is to provide a method and a draining device for draining of a device provided with a bottom discharge to solve the problem presented above.

The object of the invention is achieved by the method according to the independent claim 1 for draining of a device provided with a bottom discharge and by a draining device according to the independent claim 10 for draining of a device provided with a bottom discharge.

Preferred embodiments of the invention are described in the dependent claims.

The invention is based on the fact that for draining of a device provided with a bottom discharge, a draining device separate from the device to be drained is used. In connection with using the draining device, the draining device can be adapted to the bottom discharge of the device that is to be drained. The draining device comprises a pipe member, which is to be brought through the bottom discharge of the device, so that the pipe member is located at least partly in the interior of the device to be drained. The draining device comprises a channel that has a first open end and a second open end. The draining device is designed so that when the pipe member is brought through the bottom discharge of the device, so that the pipe member is at least partly located in the interior of the device to be drained, the first open end of the channel simultaneously settles in the interior of the device to be drained, while the second open end of the channel settles outside the device to be drained. In this way, the contents of the device to be drained can be drained out by means of the draining device through the channel of the draining device.

In a solution according to the invention, the draining device comprises a flange member that comprises an opening provided with female threads. In this preferred embodiment, the female threads of the flange member are adapted to cooperate with the male threads provided on the pipe member, so that the location of the flange member on the pipe member can be changed by turning the flange member that is adapted to the pipe member. In this preferred embodiment, the flange member further comprises fastening members for fastening the flange member to the bottom discharge of the device to be drained so that, after fastening the flange member, the pipe member can be brought from outside the device to be drained through the bottom discharge at least partly into the interior of the device to be drained by turning or screwing the pipe member with respect to the flange member that is attached to the bottom discharge of the device to be drained. In this preferred embodiment, the pipe member can thus "bore" through the possible deposit that is in the device to be drained next to the bottom discharge. One advantage provided by this solution is that the female threads of the flange member together with the male threads of the pipe member ensure that the pipe member is brought into the device, which is to be drained, directly and in a controlled manner. Another advantage achieved by this solution is that the female threads of the flange member together with the male threads of the pipe member keep the pipe member in place with respect to the device to be drained; to be more precise,

in place in the bottom discharge of the device to be drained. The boring of the pipe member through the possible deposit next to the bottom discharge in the device to be drained is further enhanced, if the pipe member is provided with a sharp point at the end, which is taken first into the interior of the device to be drained.

As the draining device is a separate device from the device to be drained and not intended to be installed in the device to be drained until in connection with the draining stage, one and the same draining device can be used in connection with many devices to be drained.

List of figures

In the following, some preferred embodiments of the invention are described in detail with reference to the appended figures, wherein:

Fig. 1 shows part of the device that comprises the bottom discharge;

Fig. 2 shows a first preferred embodiment of the draining device according to the invention;

Figs. 3–4 show the use of the draining device shown in Fig. 2;

Fig. 5 shows a second preferred embodiment of the draining device according to the invention;

Figs. 6–9 show the use of the draining device shown in Fig. 5;

Fig. 10 shows a third preferred embodiment of the draining device according to the invention; and

Figs. 11–14 show the use of the draining device shown in Fig. 10.

Detailed description of the invention

The invention relates to a method and to a draining device for draining a device 2 provided with a bottom discharge 1. Figs. 1, 3–4, 6–9 and 11–14 show only part of the device 2 provided with the bottom discharge 1. In the said figures, the bottom discharge 1 also comprises a valve 3 and a flange 4. The flange 4 can comprise a fastening means, such as holes, for detachably attaching the draining device 5 to the flange and, at the same time, to the bottom discharge 1 of the device 2 to be drained.

First, the method and some preferred embodiments thereof are described in detail.

In the method for draining a device 2 provided with a bottom discharge 1, a draining device 5 separate from the device 2 to be drained is used, which in connection with using the draining device 5 can be adapted to the bottom discharge of the device to be drained, as shown in the figures in an exemplary manner.

The draining device 5 comprises a pipe member 6, which is intended to be brought from outside the device 2 to be drained through the bottom discharge 1, so that the pipe member 6 is partly located in the interior 7 of the device 2.

The draining device 5 comprises a channel 8, which has a first open end 9 which, when the pipe member 6 is brought from outside the device 2 to be drained through the bottom discharge 1, so that the pipe member 6 is partly located in the interior 7 of the device 2 to be drained, is adapted to be situated in the interior 7 of the device 2 to be drained and to be in contact with the interior 7 of the device 2 to be drained.

The channel 8 also has a second open end 10 which, when the pipe member 6 is brought from outside the device 2 to be drained through the bottom discharge 1, so that the pipe member 6 is partly located in the interior 7 of the device 2 to be drained, is adapted to be situated outside the device 2 to be drained.

The channel 8 can be fully formed in the pipe member 6 or, alternatively, partly in the pipe member 6 and partly, e.g., in a tube (not shown), which is connected to the pipe member 6.

The method comprises a stage, wherein the pipe member 6 of the draining device 5 is brought from outside the device 2 to be drained through the bottom discharge 1, so that the pipe member 6 of the draining device 5 is partly located in the interior 7 of the device 2 to be drained, and so that the first open end 9 of the channel 8 of the draining device 5 is located in the interior 7 of the device 2 to be drained and is in contact with the interior 7 of the device 2 to be drained for draining the interior 7 of the device 2, which is provided with the bottom discharge 1, at least partly through the channel 8 of the draining device 5, e.g., for removing the liquid contents of the device 2, which is provided with the bottom discharge 1, at least partly through the channel 8 of the draining device 5.

The draining device 5 is provided with a valve member 11 between the first open end 9 of the channel 8 and the second open end 10 of the channel 8, so that the contact between the first open end 9 of the channel 8 and the second open end 10 of the channel 8 can be opened and closed. The first embodiment shown in Figs. 2–4 and the third embodiment shown in Figs. 10–14 comprise such a valve member 11 between the first open end 9 of the channel 8 and the second open end 10 of the channel 8. In that case, the method comprises a stage, wherein the valve member 11 of the draining device 5 is opened to open a contact between the first open end 9 of the channel 8 and the second open end 10 of the channel 8 for draining the interior 7 of the device 2 provided with the bottom discharge 1 at least partly through the channel 8 of the draining device 5, e.g., for removing the liquid contents (not shown) of the device 2 provided with the bottom discharge 1 through the channel 8 of the draining de-

vice 5. The valve member 11 of the draining device 5 is preferably but not necessarily not opened until the pipe member 6 is at least partly brought into the interior 7 of the device 2 to be drained.

In the method, the pipe member 6 is preferably but not necessarily dimensioned with respect to the bottom discharge 1 so that the dimensions and the shape of the cross section of the pipe member 6 essentially correspond to those of the cross section of the opening of the bottom discharge 1. For example, it is possible that the bottom discharge 1 constitutes a pipe-like structure (not marked with a reference number) and that the pipe member 6 is dimensioned and shaped so that the outer dimension and form of the cross section of the pipe member 6 essentially correspond to the inner dimension and form of the cross section of the pipe-like structure of the bottom discharge 1.

In a preferred embodiment of the method according to the invention, the draining device 5 is provided with a seal member 12 and the seal member 12 is attached to the bottom discharge 1 of the device 2 to be drained before the pipe member 6 of the draining device 5 is brought from outside the device 2 to be drained through the bottom discharge 1.

In a preferred embodiment of the method according to the invention, the draining device 5 is provided with a flange member 13 that comprises an opening 14, as is the case in the first preferred embodiment shown in Figs. 2–4. The flange member 13 is movably adapted to the pipe member 6, so that the pipe member 6 runs through the opening 14 of the flange member 13, i.e., so that the pipe member 6 penetrates through the opening 14. In the embodiment shown in Figs. 2–4, the seal member 12 is attached to the flange member 13 and the draining device 5, so that the flange member 13 is able to move with respect to the pipe member 6. In Fig. 3, the flange member 13 is attached to the flange 4 that belongs to the bottom discharge 1 of the device 2 to be drained for attaching the seal member 12 to the bottom discharge 1 of the device 2 to be drained, before the pipe member 6 in Fig. 4 is brought into the interior 7 of the device 2 to be drained through the bottom discharge 1 of the device 2 to be drained, so that the pipe member 6 of the draining device 5 is partly located in the interior 7 of the device 2 to be drained, and so that the first open end 9 of the channel 8 of the draining device 5 is located in the interior 7 of the device 2 to be drained and is in contact with the interior 7 of the device 2 to be drained. In this preferred embodiment, the flange member 13 is preferably but not necessarily detachably attached to the bottom discharge 1 of the device 2 to be drained by bolts or similar fastening members (not shown). In the figures, the flange member 13 is detachably attached by bolts to the flange 4 that belongs to the bottom discharge 1 of the device 2 to be drained.

In the first embodiment shown in Figs. 2-4, a winching device 18 is used to hoist the draining device 5 upwards with respect to the device 2 to be drained, so that the pipe member 6 at least partly enters the interior 7 of the device 2 to be drained.

In a preferred embodiment of the method according to the invention, such as the second preferred embodiment shown in Figs. 5–9 and the third preferred embodiment shown in Figs. 10–14, the draining device 5 is provided with a flange member 13 that comprises an opening 14 provided with female threads 15. In this preferred embodiment, the pipe member 6 is provided with male threads 16, respectively, which cooperate with the female threads 15 of the opening 14 of the flange member 13. In this preferred embodiment, the flange member 13 is movably adapted to the pipe member 6, so that the pipe member 6 runs through the opening 14 of the flange member 13, i.e., so that the pipe member 6 penetrates through the opening 14. In this preferred embodiment, the flange member 13 is attached to the bottom discharge 1 of the device 2 to be drained, before the pipe member 6 is brought into the interior 7 of the device 2 to be drained, by rotating or "screwing" the pipe member 6 through the bottom discharge 1 of the device 2 to be drained, so that the first open end 9 of the channel 8 of the draining device 5 is located in the interior 7 of the device 2 to be drained and is in contact with the interior 7 of the device 2 to be drained. The flange member 13 is preferably but not necessarily detachably attached to the bottom discharge 1. For example, it is possible that the flange member 13 is attached to the bottom discharge 1 by bolts or similar fastening members (not shown). In the figures, the flange member 13 is detachably attached by bolts to the flange 4 that belongs to the bottom discharge 1 of the device 2 to be drained. In the second and third preferred embodiments shown in Figs. 5–14, the seal member 12 is attached to the flange member and the draining device 5, so that the flange member is able to move, i.e., rotate with respect to the pipe member 6. In the second and third preferred embodiments shown in Figs. 5–14, the draining device 5 comprises cranks 20 for turning the pipe member 6 with respect to the flange member 13 attached to the bottom discharge 1, so that the pipe member 6 at least partly enters the interior 7 of the device 2 to be drained.

Figs. 6–9 show part of the operating principle of the second preferred embodiment of the method according to the invention. In Fig. 6, the draining device 5 is attached to the bottom discharge 1 of the device 2 to be drained. In Figs. 7 and 8, the draining device 5 is attached to the bottom discharge 1 of the device 2 to be drained and the pipe member 6 is turned or screwed with respect to the flange member 13 that is attached to the bottom discharge 1 of the device 2 to be drained. In Fig. 9, the pipe member 6 penetrates the deposit 17 on the bottom of the interior 7 of the device 2 to be drained, after which the contents of the device 2 to be drained can be drained out through the channel 8 of the draining device 5.

The pipe member 6 is preferably but not necessarily provided with a sharp point 19, and the method then comprises a stage, wherein the pipe member 6, with the sharp point 19 ahead, is brought into the interior 7 of the device 2 to be drained through the bottom discharge 1 of the device 2 to be drained. In the embodiments shown in the figures, the pipe member 6 is provided with triangular pieces (not marked with reference numbers), which have sharp edges and which constitute the sharp point 19 of the pipe member 6. It is also possible that the sharp point 19 comprises a saw-shaped structure, the purpose of which is to bore a way through the deposit 17 that lies on the bottom of the interior 7 of the device 2 to be drained.

The method preferably but not necessarily comprises a stage, wherein an agent that softens the deposit 17 is fed through the draining device 5 into the interior 7 of the device 2 to be drained. The second preferred embodiment shown in Figs. 5–9 comprises a feeding means 19 for feeding the agent (not shown) that softens the deposit 17 into the interior 7 of the device 2 to be drained through the draining device 5.

In the embodiments shown in the figures, the device 2 having the bottom discharge 1 comprising the valve 3 is drained, whereby the valve 3 is first opened and, thereafter, the pipe member 6 is brought through the opened valve 3.

The invention relates also to a draining device 5 for draining a device 2 provided with a bottom discharge 1.

The draining device 5 is a device separate from the device 2 to be drained, which in connection with the use can be adapted to the bottom discharge 1 of the device 2 to be drained, as shown in the figures.

The draining device 5 comprises the pipe member 6, which is intended to be taken from outside the device 2 to be drained through the bottom discharge 1, so that the pipe member 6 is partly located in the interior 7 of the device 2 to be drained.

The draining device 5 comprises a channel 8, which is at least partly formed in the pipe member 6. For example, it is possible that a tube (not shown) is attached to the pipe member 6, so that the channel 8 comprises a portion in the pipe member 6 and a portion in the tube.

The channel 8 has a first open end 9 which, when the pipe member 6 is brought from outside the device 2 to be drained through the bottom discharge 1, so that the pipe member 6 is partly located in the interior 7 of the device 2 to be drained, is adapted to be situated in the interior 7 of the device 2 to be drained and to be in contact with the interior 7 of the device 2 to be drained.

The channel 8 has a second open end 10 which, when the pipe member 6 is brought from outside the device 2 to be drained through the bottom discharge 1, so that the pipe member 6 is partly located in the interior 7 of the device 2 to be drained, is adapted to be situated outside the device 2 to be drained.

The draining device 5 comprises a valve member 11 between the first open end 9 and the second open end 10 of the channel 8, so that the contact between the first open end 9 of the channel 8 and the second open 10 end of the channel 8 can be opened and closed.

The pipe member 6 is preferably but not necessarily dimensioned so that the dimensions and the shape of the cross section of the pipe member 6 essentially correspond to those of the cross section of the opening 14 of the bottom discharge 1 of the device 2 to be drained. For example, it is possible that the bottom discharge 1 constitutes a pipe-like structure (not marked with a reference number) and that the pipe member 6 is dimensioned and shaped so that the outer dimension and form of the cross section of the pipe member 6 essentially correspond to the inner dimension and form of the cross section of the pipe-like structure of the bottom discharge 1.

The draining device 5 is preferably but not necessarily provided with a seal member 12, which can be attached to the bottom discharge 1 of the device 2 to be drained before the pipe member 6 of the draining device 5 is brought from outside the device 2 to be drained through the bottom discharge 1.

In the first preferred embodiment shown in Figs. 2–4, the draining device 5 is provided with a flange member 13 that comprises an opening 14. In this preferred embodiment, the flange member 13 is movably adapted to the pipe member 6, so that the pipe member 6 runs through the opening 14 of the flange member 13, i.e., so that the pipe member 6 penetrates through the opening 14 of the flange member 13. In the embodiment shown in Figs. 2–4, the draining device 5 comprises a seal member 12, which is attached to the flange member 13 and the draining device 5, so that the flange member 13 is able to move with respect to the pipe member 6. In this preferred embodiment, the flange member 13 can be attached to the bottom discharge 1 of the device 2 to be drained before the pipe member 6 of the draining device 5 is brought from outside the device 2 to be drained through the bottom discharge 1. In the first preferred embodiment shown in Fig. 2–4, the seal member 12 is a bellows-type member or the like, which is attached to the flange member 13 and the draining device 5, so that the bellows-type member or the like at least partly encloses the pipe member 6.

In the first embodiment shown in Figs. 2–4, the draining device 5 comprises a winching device 18 for hoisting the draining device 5 upwards with respect to the device 2 to be drained, so that the pipe member 6 at least partly enters the interior 7 of the device 2 to be drained.

In the second preferred embodiment shown in Figs. 5–9 and the third preferred embodiment shown in Figs. 10–14, the draining device 5 is provided with a flange member 13 that comprises an opening 14 provided with female threads 15. In these preferred embodiments, the female threads 15 of the flange member cooperate with

the male threads 16 provided on the pipe member 6, so that the location of the flange member on the pipe member 6 can be changed by turning the flange member that is adapted to the pipe member 6. In these preferred embodiments, the flange member comprises fastening members for attaching the flange member to the bottom discharge 1 of the device 2 to be drained so that, thereafter, the pipe member 6 can be brought from outside the device 2 to be drained and through the bottom discharge 1 into the interior 7 of the device 2 to be drained by turning or "screwing" the pipe member 6 with respect to the flange member that is attached to the bottom discharge 1 of the device 2 to be drained. In the embodiments shown in Figs. 5–14, the draining device 5 comprises a seal member 12, which is attached to the flange member 13 and the draining device 5, so that the flange member 13 is able to move with respect to the pipe member 6. In the embodiments shown in Figs. 5–14, the draining device 5 comprises a fastening member for detachably attaching the flange member 13 to the bottom discharge 1 of the device 2 to be drained by separate fastening members, such as bolts.

In the embodiments shown in the figures, the pipe member 6 of the draining device 5 comprises a sharp point 19. In the embodiments shown in the figures, the pipe member 6 is provided with triangular pieces, which have sharp edges and which constitute the sharp point 19 of the pipe member 6. It is also possible that the sharp point 19 comprises a saw-shaped structure intended to bore a way through the blockage.

The second preferred embodiment shown in Figs. 5–9 comprises a feeding means 19 for feeding the agent that softens the deposit 17 into the interior 7 of the device to be drained through the draining device 5.

It is obvious to those skilled in the art that with the technology improving, the basic idea of the invention can be implemented in various ways. Thus, the invention and its embodiments are not limited to the examples described above but they may vary within the claims.

CLAIMS

1. A method for draining a device (2) provided with a bottom discharge (1), **characterised** in

that the method a draining device (5) is used, which is separate from the device (2) to be drained and which, in connection with using the draining device (5), can be adapted to the bottom discharge (1) of the device (2) to be drained, the draining device (5) comprising a pipe member (6), which is intended to be brought from outside the device (2) to be drained through the bottom discharge (1), so that the pipe member (6) is partly located in the interior (7) of the device (2) to be drained, the draining device (5) comprising a channel (8) that has a first open end (9) which, when the pipe member (6) is brought from outside the device (2) to be drained through the bottom discharge (1), so that the pipe member (6) is partly situated in the interior (7) of the device (2) to be drained, is adapted to be located in the interior (7) of the device (2) to be drained and to be in contact with the interior (7) of the device (2) to be drained, the channel (8) having a second open end (10) which, when the pipe member (6) is brought from outside the device (2) to be drained through the bottom discharge (1), so that the pipe member (6) is partly located in the interior (7) of the device (2) to be drained, is adapted to be located outside the device (2) to be drained;

that the method comprises a stage, wherein the pipe member (6) of the draining device (5) is brought from outside the device (2) to be drained through the bottom discharge (1), so that the pipe member (6) of the draining device (5) is partly located in the interior (7) of the device (2) to be drained, and so that the first open end (9) of the channel (8) of the draining device (5) is located in the interior (7) of the device (2) to be drained and is in contact with the interior (7) of the device (2) to be drained for draining the interior (7) of the device (2) provided with the bottom discharge (1) at least partly through the channel (8) of the draining device (5);

that the draining device (5) is provided with a valve member (11) between the first open end (9) and the second open end (10) of the channel (8), so that the contact between the first open end (9) of the channel (8) and the second open end (10) of the channel (8) can be opened and closed; and

that the method comprises a stage, wherein the valve member (11) of the draining device (5) is opened for opening a contact between the first open end (9) of the channel (8) and the second open end (10) of the channel (8) for emptying the interior (7) of the device (2) provided with the bottom discharger (1) at least partly through the channel (8) of the draining device (5).

2. A method according to Claim 1, **characterised** in that the pipe member (6) is dimensioned with respect to the bottom discharge (1) so that the dimensions and the shape of the cross section of the pipe member (6) essentially correspond to those of the cross section of the bottom discharge (1).

3. A method according to Claims 1or 2, **characterised** in

that the draining device (5) is provided with a flange member (13) that comprises an opening (14);

that the flange member (13) is movably adapted to the pipe member (6), so that the pipe member (6) runs through the opening (14) of the flange member (13); and

that the flange member (13) is attached to the bottom discharge (1) of the device (2) to be drained before the pipe member (6) is brought into the interior (7) of the device (2) to be drained through the bottom discharge (1) of the device (2) to be drained, so that the pipe member (6) is partly located in the interior (7) of the device (2) to be drained, and so that the first open end (9) of the channel (8) of the draining device (5) is located in the interior (7) of the device (2) to be drained and is in contact with the interior (7) of the device (2) to be drained.

4. A method according to Claim 3, **characterised** in

that the draining device (5) is provided with a flange member (13) that comprises an opening (14) provided with female threads (15);

that the pipe member (6) is provided with male threads (16), which cooperate with the female threads (15) of the opening (14) of the flange member (13);

that the flange member (13) is movably adapted to the pipe member (6), so that the pipe member (6) runs through the opening (14) of the flange member (13); and

that the flange member (13) is attached to the bottom discharge (1) of the device (2) to be drained before the pipe member (6) is brought into the interior (7) of the device (2) to be drained by turning the pipe member (6) through the bottom discharge (1) of the device (2) to be drained, so that the first open end (9) of the channel (8) of the draining device (5) is located in the interior (7) of the device (2) to be drained and is in contact with the interior (7) of the device (2) to be drained.

5. A method according to Claim 3 or 4, **characterised** in

that a seal member (12) is attached to the flange member (13) and the draining device (5), so that the flange member (13) is able to move with respect to the pipe member (6).

6. A method according to Claim 5, **characterised** in that a bellows-like connecting element or the like is used as the seal member (12), which is attached to the flange member (13) and the draining device (5), so that the bellows-like member or the like at least partly encloses the pipe member (6).

7. A method according to any of Claims 3–6, **characterised** in that the flange member (13) is detachably attached by bolts or corresponding separate fastening members to the bottom discharge (1) of the device (2) to be drained.

8. A method according to any of Claims 1–7, **characterised** in

that the pipe member (6) is provided with a sharp point (19); and

that the pipe member (6) with its sharp point (19) ahead is brought into the interior (7) of the device (2) to be drained.

9. A method according to any of Claims 1–8, **characterised** in

that the device (2), the bottom discharge (1) of which comprises a valve (3), is drained; and

that the the valve (3) is first opened and the pipe member (6) is thereafter brought through the opened valve (3).

10. A draining device for draining a device (2) provided with a bottom discharge (1), **characterised** in

that the draining device (5) is a device separate from the device (2) to be drained, which in connection with using the draining device can be adapted to the bottom discharge (1) of the device (2) to be drained;

that the draining device (5) comprises a pipe member (6), which is intended to be brought from outside the device (2) to be drained through the bottom discharge (1), so that the pipe member (6) is partly located in the interior (7) of the device (2) to be drained;

that the draining device (5) comprises a channel (8);

that the channel (8) has a first open end (9) which, when the pipe member (6) is brought from outside the device (2) to be drained through the bottom discharge (1), so that the pipe member (6) is partly located in the interior (7) of the device (2) to be drained, is adapted to be situated in the interior (7) of the device (2) to be drained;

that the channel (8) has a second open end (10) which, when the pipe member (6) is brought from outside the device (2) to be drained through the bottom discharge (1), so that the pipe member (6) is partly located in the interior (7) of the device (2) to

be drained, is adapted to be situated outside the device (2) to be drained, anddraining device

that the draining device (5) comprises a valve member (11) between the first open end (9) and the second open end (10) of the channel (8), so that the contact between the first open end (9) of the channel (8) and the second open end (10) of the channel (8) can be opened and closed.

11. A draining device according to Claim 10, **characterised** in that the pipe member (6) is dimensioned so that the dimensions and the shape of the cross section of the pipe member (6) essentially correspond to those of the cross section of the bottom discharge (1) of the device (2) to be drained.

12. A draining device according to Claim 10 or 11, **characterised** in

that the draining device (5) is provided with a flange member (13) that comprises an opening (14);

that the flange member (13) is movably adapted to the pipe member (6), so that the pipe member (6) runs through the opening (14) of the flange member (13);

that the draining device (5) comprises a seal member (12), which is attached to the flange member (13) and the draining device (5), so that the flange member (13) is able to move with respect to the pipe member (6); and

that the flange member (13) can be attached to the bottom discharge (1) of the device (2) to be drained before the pipe member (6) of the draining device (5) is brought from outside the device (2) to be drained through the bottom discharge (1).

13. A draining device according to Claim 12, **characterised** in

that the opening (14) of the flange member (13) comprises female threads (15); and

that the female threads (15) cooperate with the male threads (16) provided on the pipe member (6), so that the pipe member (6) can be brought from outside the device (2) to be drained through the bottom discharge (1) of the device (2) to be drained at least partly into the interior (7) of the device (2) to be drained by turning the pipe member (6) with respect to the flange member (13) that is attached to the bottom discharge (1) of the device (2) to be drained.

14. A draining device according to Claim 12 or 13, **characterised** in

that the draining device (5) comprises a seal member (12), which is attached to the flange member (13) and the draining device (5), so that the flange member (13) is able to move with respect to the pipe member (6).

15. A draining device according to Claim 14, **characterised** in that the seal member (12) is a bellows-like connecting element or the like, which is attached to the flange member (13) and the draining device (5), so that the bellows-like connecting element or the like at least partly encloses the pipe member (6).

16. A draining device according to any of Claims 12–15, **characterised** in that the flange member (13) comprises fastening members for detachably attaching the flange member (13) to the bottom discharge (1) of the device (2) provided with the bottom discharge (1) by bolts or similar separate fastening members.

17. A draining device according to any of Claims 10–16, **characterised** in that the pipe member (6) of the draining device (5) comprises a sharp point (19).

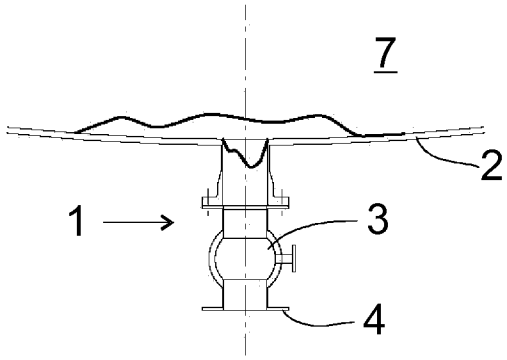


Fig.1

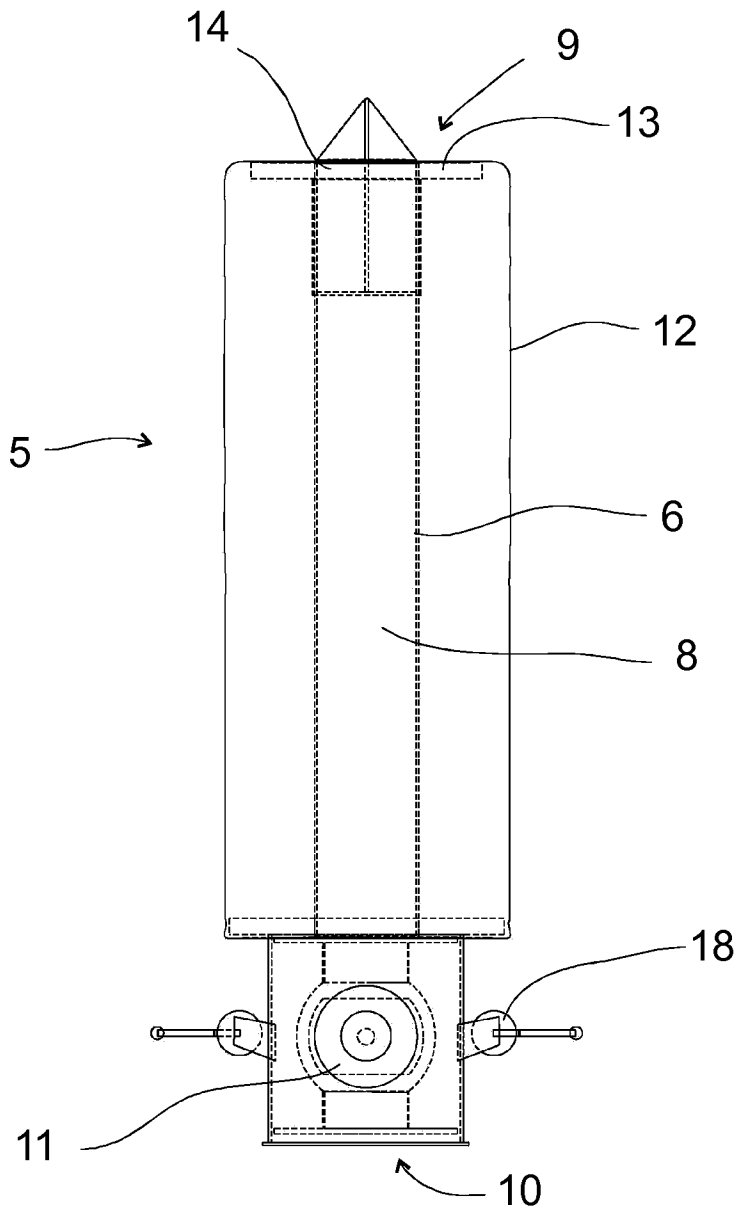


Fig.2

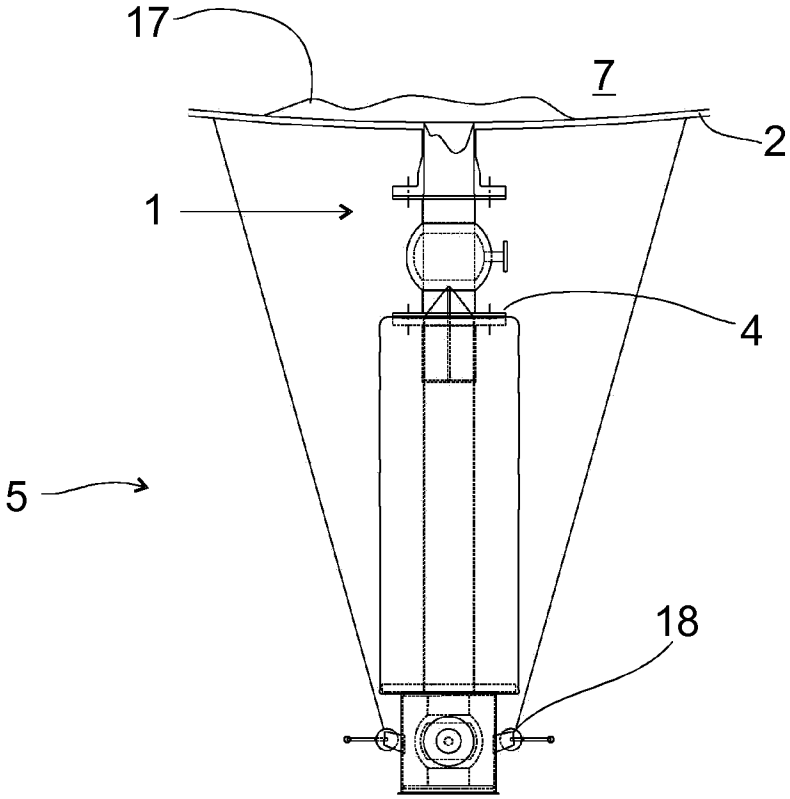


Fig.3

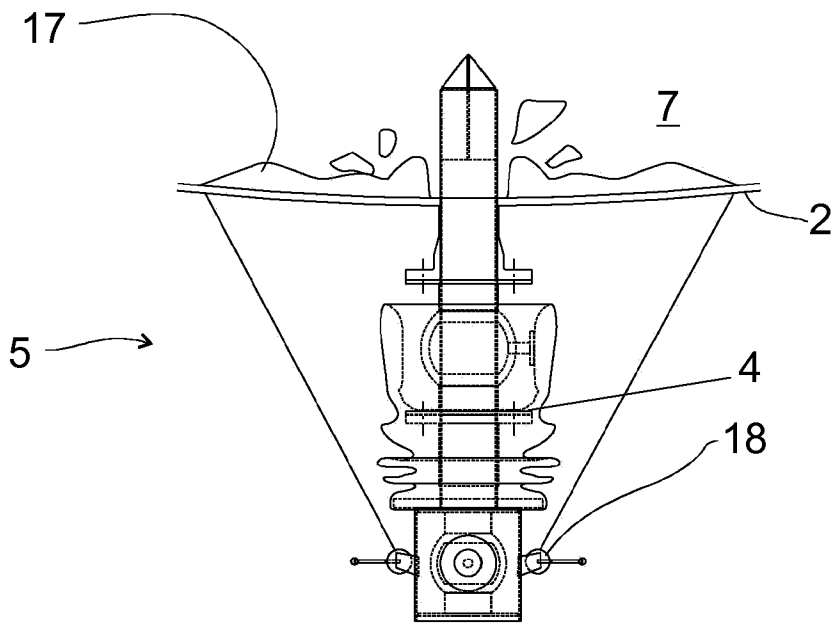


Fig.4

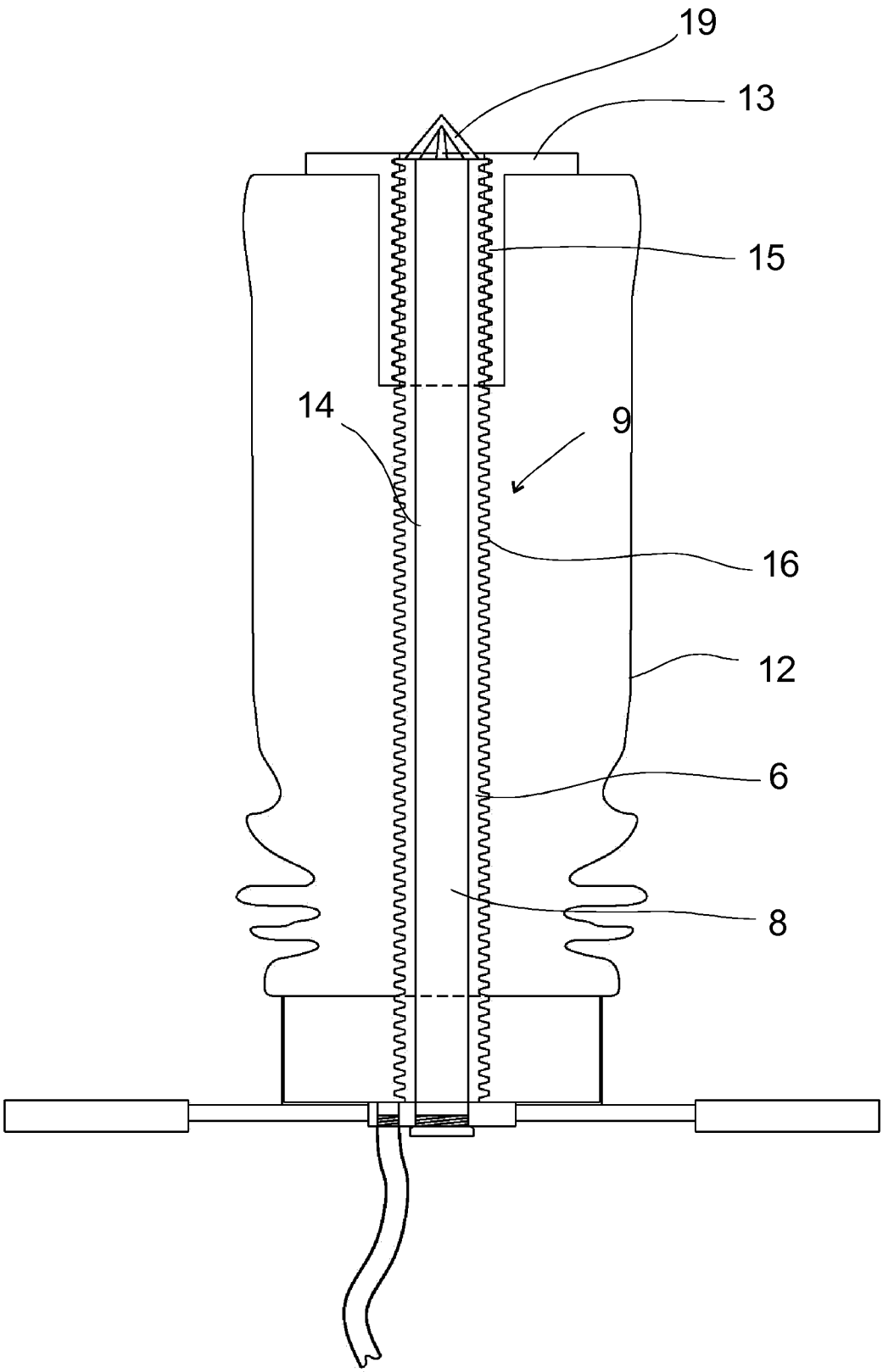


Fig.5

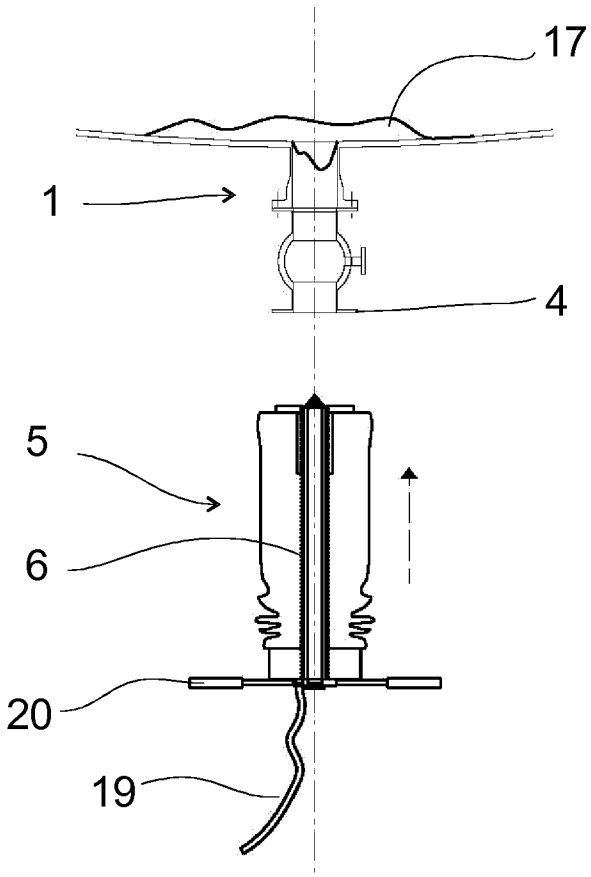


Fig.6

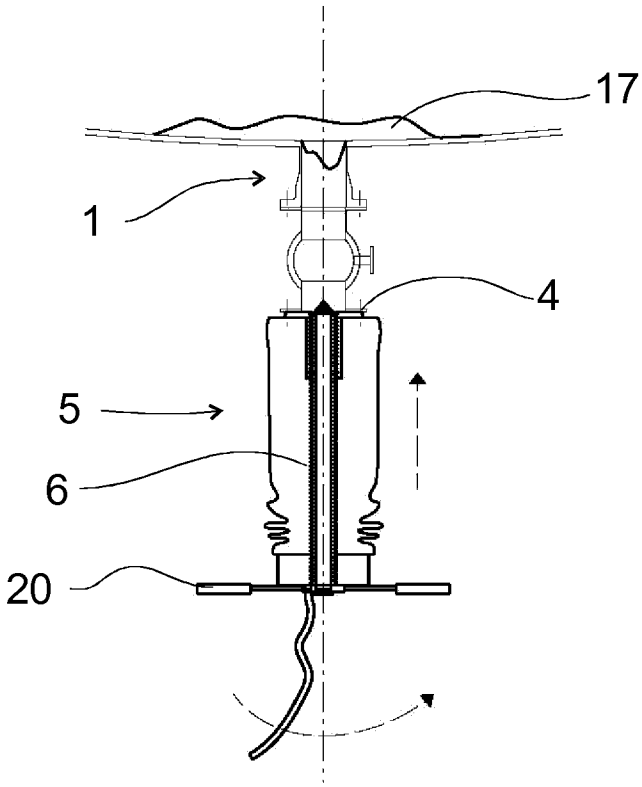


Fig.7

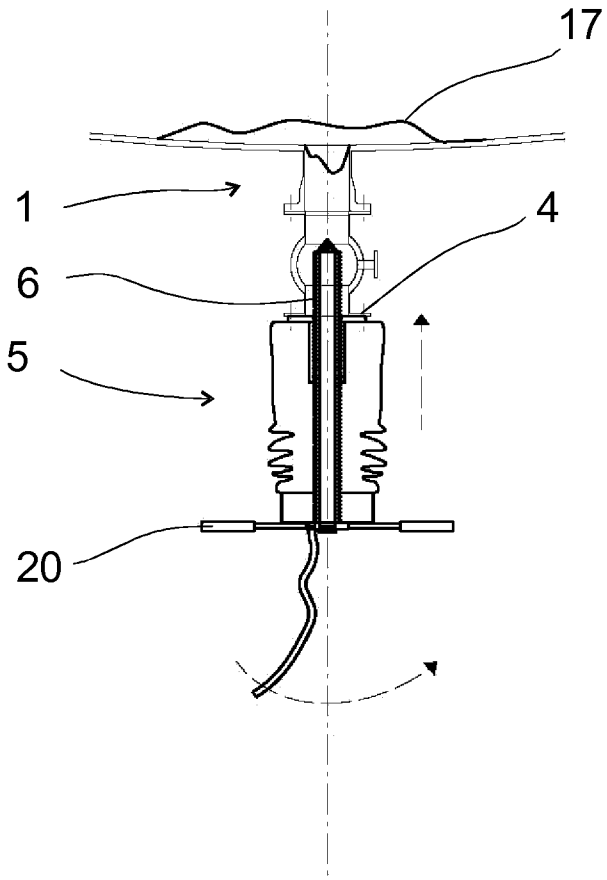


Fig.8

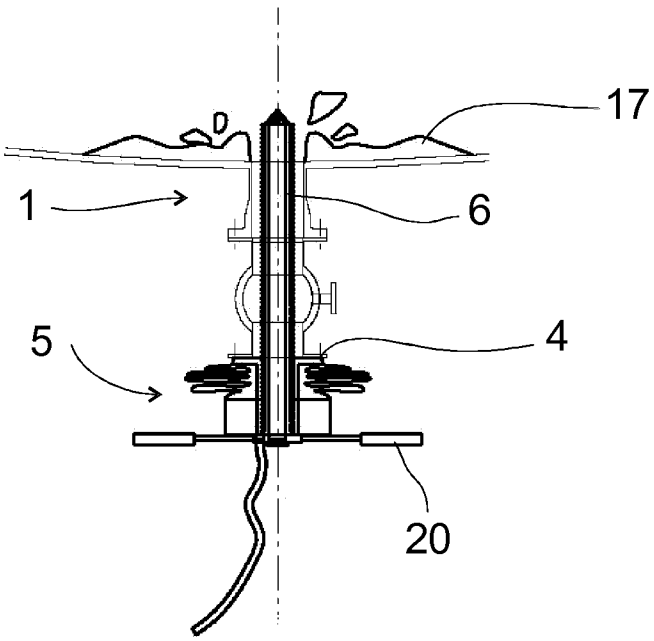


Fig.9

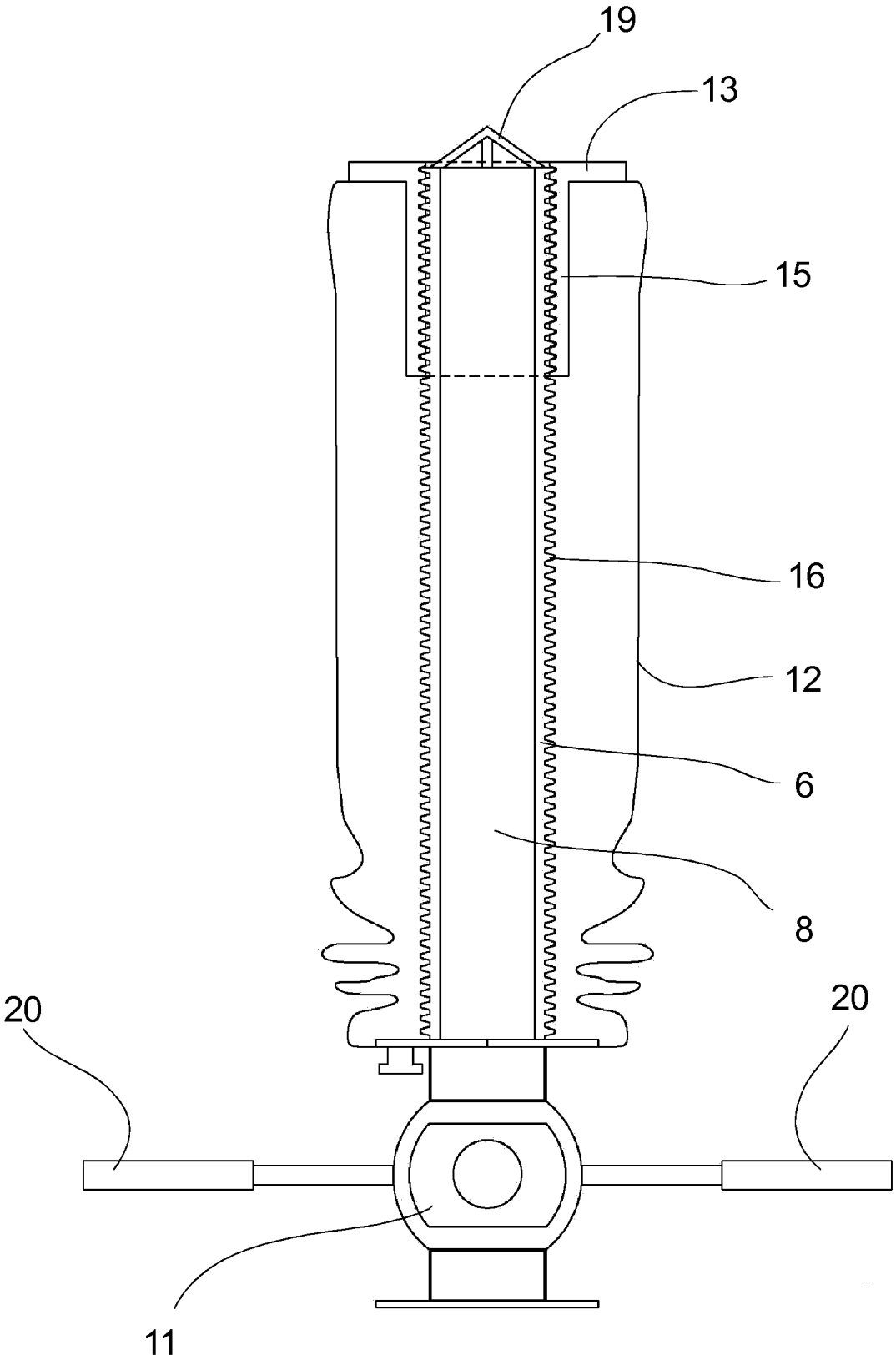


Fig.10

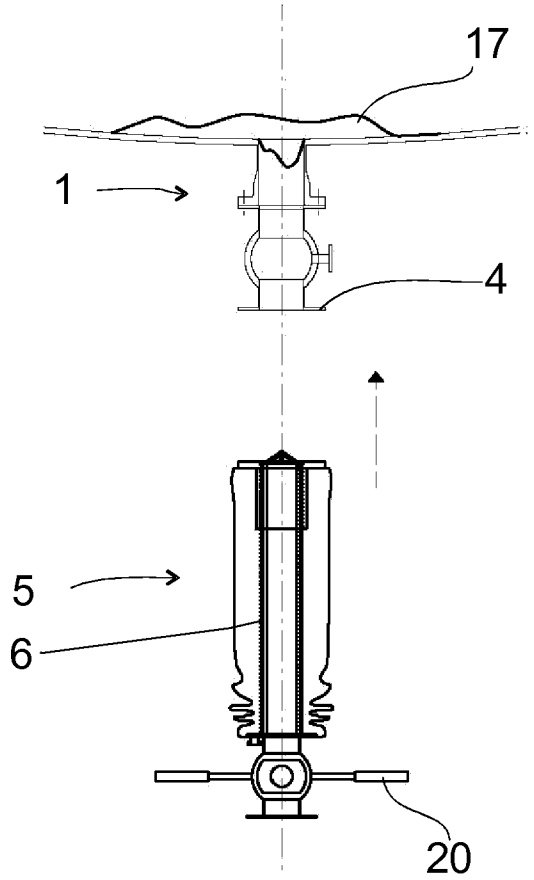


Fig.11

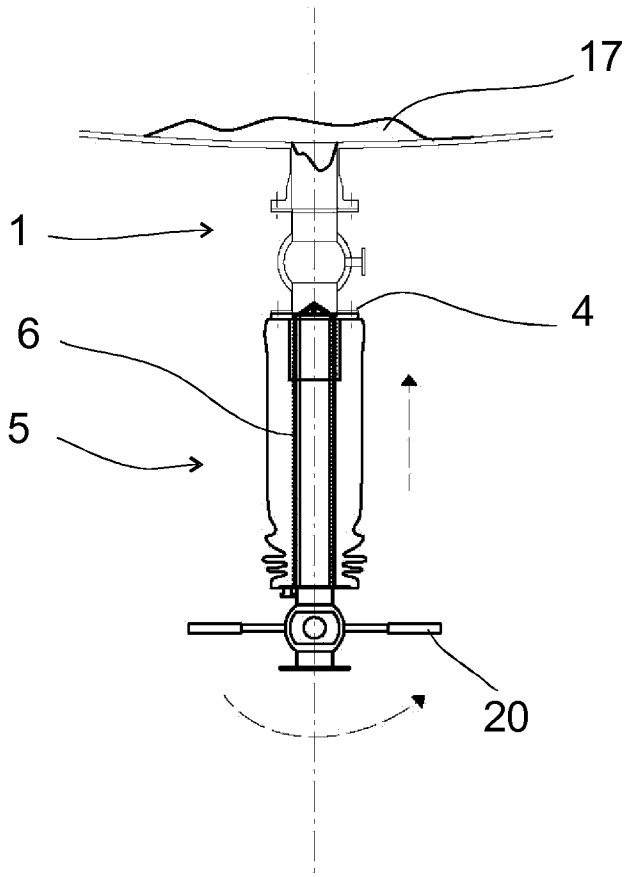


Fig.12

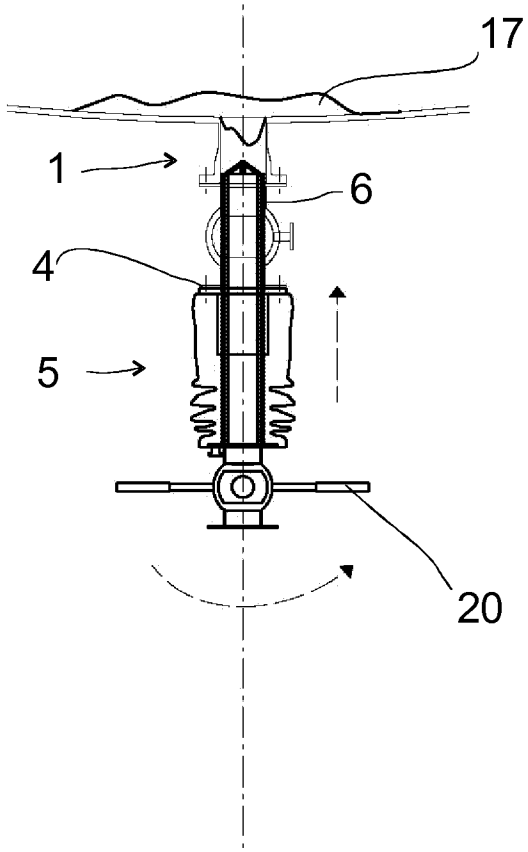


Fig.13

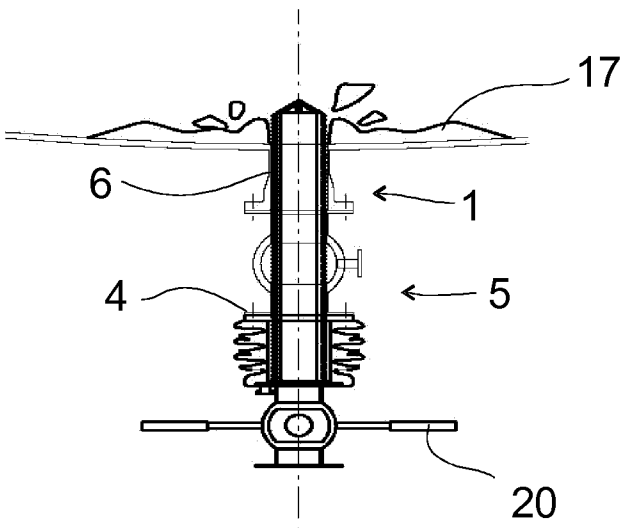


Fig.14

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2010/050333

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

FI, SE, NO, DK

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2940098 A (DUBSON ADLAI S) 14 June 1960 (14.06.1960) column 2, lines 11-27; figures 1-4	1-3, 5, 7-12, 14, 16-17
A	US 6363566 B1 (COLLINS MICHAEL) 02 April 2002 (02.04.2002)	1-17
A	US 5558140 A (CLARK JAMES E II) 24 September 1996 (24.09.1996)	1-17
A	US 2001007355 A1 (COUPAL ANDRE) 12 July 2001 (12.07.2001)	1-17

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 July 2010 (09.07.2010)	09 July 2010 (09.07.2010)

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/FI2010/050333

Patent document cited in search report	Publication date	Patent family members(s)	Publication date
US 2940098 A	14/06/1960	None	
US 6363566 B1	02/04/2002	None	
US 5558140 A	24/09/1996	US 6199578 B1	13/03/2001
		WO 9721023 A1	12/06/1997
		ES 2197215T T3	01/01/2004
		EP 0864033 A1	16/09/1998
		DK 0864033T T3	07/07/2003
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		CA 2238938 A1	12/06/1997
US 2001007355 A1	12/07/2001	CA 2330890 A1	11/07/2001
		CA 2295187 A1	11/07/2001

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2010/050333

CLASSIFICATION OF SUBJECT MATTER

Int.Cl.
B65D 25/38 (2006.01)
B08B 9/043 (2006.01)
B65D 47/00 (2006.01)
F16K 5/08 (2006.01)
F16K 43/00 (2006.01)