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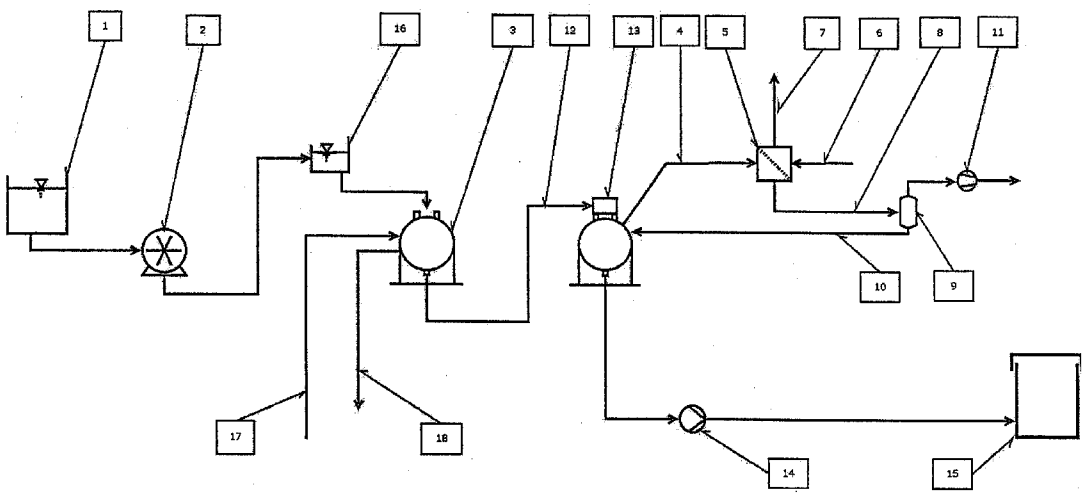
(54) **Title:** EQUIPMENT FOR THE DISCONTINUOUS OR CONTINUOUS HYDROLYSIS OF ORGANIC MATTER



(57) **Abstract:** The equipment for the discontinuous or continuous hydrolysis of organic matter according to Fig. 1 and Fig. 2 consists of the of the receiving trough (1) connected to the crusher (2), to which the measurement tank (16) is connected, and further connected to the hydrolyzer (3) interconnected via the shooting pipe (12) to the expander (13) with the connected pipe (4) to discharge waste vapours, connected to the condenser (5) to which the pipe (6) conducting cooling medium is connected, as well as the pipe (7) of the cooling medium outlet and the pipe (8) to conduct waste condensate and not condensed gases. This pipe is further connected to the degasifier (9) to which the fan (11) to suck not condensed gases is connected, as well as the pipe (10) of waste condensate connected to the expander (13), to which the pump (14) of boiled matter interconnected with the fermeter (15). is connected Hydrolyser (3) is designed with the connected pipe (17) to feed the steam and the pipe (18) to discharge the steam condensate from the hydrolyzer (3).

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Equipment for the discontinuous or continuous hydrolysis of organic matter

TECHNICAL FIELDS

The invention involves the equipment for the discontinuous or continuous hydrolysis of organic matter, which reaches the raw material destruction up to a level of the cellular structure.

BACKGROUND ARTS

Until now the hydrolysis has been performed so that the matter was transported from the receiving trough to the crusher in which the raw material was crushed to the required size. Raw material was transported from the crusher by means of the pump to the heat exchanger, where the raw material was heated to the required temperature. The heated raw material was transported to the retaining container to be kept for a period of one hour, resulting in the raw material pasteurization. After that the material was pumped off by means of a pump to the fermenter and the whole cycle was repeated.

The system drawback consisted in that the raw material was not perfectly disturbed / crushed, which resulted in the reduced methane production, and the period of keeping the raw material in the retaining container could not be shortened.

DISCLOSURE OF INVENTION

The above deficiencies are eliminated by the equipment for the discontinuous or continuous hydrolysis of organic matter, i.e. according to this invention, the substance of which consists in that the equipment for discontinuous hydrolysis consists of the receiving trough connected to the crusher, to which the measurement tank is connected. The latter is connected to the hydrolyzer interconnected via the overshooting pipe to the expander with the connected pipe to discharge waste vapours, connected to the condenser to which the pipe conducting cooling medium is connected, as well as the pipe of the cooling medium outlet and the pipe to conduct waste condensate and not condensed gases. This pipe is further connected to the degasifier to which the fan to suck not condensed gases is connected, as well as the pipe of waste condensate connected to the expander, to which the pump of boiled matter, interconnected with the fermenter, connected Hydrolyser is designed with the connected pipe to feed the steam and the pipe to discharge the steam condensate.

The equipment is conveniently interconnected with the pump of boiled matter to the input raw material cooler, to which the supply pipe of water heating circuit, discharge pipe and cooled material pipe are conducted. The supply and discharge pipes of the water heating circuit are connected to the input raw material pre-heater, interconnected between the crusher and the measuring tank.

The equipment for continuous hydrolysis consists of the receiving trough interconnected with the crusher with the connected pump of crushed raw material, which is connected to the inter-container connected by high-pressure pump to the hydrolyser. The hydrolyser is connected to the heat source via the fume conduit to the stack. The hydrolyser is further connected via the overshooting pipe to the counter-pressure head , connected with the pipe to discharge waste vapours to the condenser designed for the cooling medium inlet and outlet and the pipe to discharge waste condensate and not condensed gases, which is connected to the degasifier, to which the fan and waste condensate pipe, connected to the shower head, are connected. Expander is connected via the boiled matter pump to the fermenter.

The equipment is conveniently designed connected after the boiled matter pump with the output raw material cooler connected to the supply and discharge pipes of the water heating circuit to the inlet raw material pre-heater and the connected pipe for the cooled material, brought out to the fermenter.

The biggest advantages of the above equipment include the fact that the raw material is completely destroyed during its operation to a level of cellular structure, so that more methane is obtained from such significantly decomposed matter and the period of keeping the matter in the fermenter is reduced.

BRIEF DESCRIPTION OF DRAWINGS

The invention will be clarified more in detail by means of the drawings, among which Fig. 1 shows the discontinuous plant without the preheating of input raw material, Fig. 2 shows the plant with the preheating of input raw material, Fig. 3 shows the continuous process utilizing the thermal source waste gases and the counter-pressure head to accelerate the technologic process. Fig. 4 shows utilization of the heating medium during the raw material pre-heating.

MADE FOR CARRING OUT THE INVENTION

Example 1

The equipment for the discontinuous or continuous hydrolysis of organic matter according to Fig. 1 and Fig. 2 consists of the of the receiving trough 1 connected to the crusher 2, to which the measurement tank 16 is connected, and further connected to the hydrolyzer 3 interconnected via the overshooting pipe 12 to the expander 13 with the connected pipe 4 to discharge waste vapours, connected to the condenser 5 to which the pipe 6 conducting cooling medium is connected, as well as the pipe 7 of the cooling medium outlet and the pipe 8 to conduct waste condensate and not condensed gases. This pipe is further connected to the degasifier 9 to which the fan 11 to suck not

condensed gases is connected, as well as the pipe 10 of waste condensate connected to the expander 13, to which the pump 14 of boiled matter interconnected with the fermenter 15 is connected. Hydrolyser 3 is designed with the connected pipe 17 to feed the steam and the pipe 18 to discharge the steam condensate from the hydrolyzer 3. The equipment for the discontinuous hydrolysis of organic matter is designed with the pipe 14 of boiled material connected to the cooler 19 of output raw material, to which the supply pipe 21 of water heating circuit, discharge pipe 20 of water heating circuit and pipe 23 of cooled material are connected, and both the pipes 20 and 21 are connected to the pre-heater 22 of the input raw material, interconnected between the crusher 2 and the measurement tank 16.

Example 2

The equipment for the continuous hydrolysis of organic matter according to Fig. 3 and Fig. 4 consists of the receiving trough 1 connected to the crusher 2 with the connected pump 24 of crushed raw material, which is connected to the inter-container 25 connected by high-pressure pump 26 to the hydrolyser 3. The hydrolyser 3 is connected to the heat source 27 via the waste gases conduit 28 to the stack 30. The hydrolyser is further connected via the overshooting pipe 12 to the counter-pressure head 29, connected via the pipe 4 to discharge the waste vapours to the condenser 5 designed with the pipe 6 of the cooling medium inlet and the pipe 7 of the cooling medium outlet and the pipe 8 to discharge waste condensate and not condensed gases, which is connected to the degasifier 9, to which the fan 11 and waste condensate pipe 10 , connected to the shower head 31, are connected. Expander 13 is connected via the boiled matter pump 14 of boiler material to the fermenter 15. The equipment for the continuous hydrolysis of organic matter is designed with the pump 14 of boiler material connected to the cooler 19 of output raw material, into which the supply pipe 21 of water heating circuit, discharge pipe 20 of water heating circuit and pipe 23 of cooled material are connected, and both the pipes 20 and 21 are connected to the pre-heater 22 of the input raw material, and connected to the pipe 23 for the cooled material, brought out to the fermenter15.

PATENT CLAIMS

1. Equipment for discontinuous hydrolysis of organic matter **distinguished by that** it consists of the of the receiving trough (1) connected to the crusher (2) to which the measurement tank (16) is connected, and further connected to the hydrolyzer (3) interconnected via the overshooting pipe (12) to the expander (13) with the connected pipe (4) to discharge waste vapours, connected to the condenser (5) to which the pipe (6) conducting cooling medium is connected, as well as the pipe (7) of the cooling medium outlet and the pipe (8) to conduct waste condensate and not condensed gases. This pipe is further connected to the degasifier (9) to which the fan (11) to suck not condensed gases is connected, as well as the pipe (10) of waste condensate connected to the expander(13), to which the pump (14) of boiled matter interconnected with the fermenter (15) is connected. Hydrolyser (3) is designed with the connected pipe (17) to feed the steam and the pipe 18 to discharge the steam condensate from the hydrolyzer 3.

2. Equipment for discontinuous hydrolysis of organic matter according to claim 1 **distinguished by that** the pump (14) of boiled material is connected to the cooler (19) of output raw material, to which the supply pipe (21) of water heating circuit, discharge pipe (20) of water heating circuit and pipe (23) of cooled material are connected, while both the pipes (20, 21) are connected to the pre-heater (22) of input raw material, which is interconnected between the crusher (2) and the measurement tank (16).

3. Equipment for continuous hydrolysis of organic matter **distinguished by that** it consists of the receiving trough (1) connected to the crusher (2) with the connected pump (24) of crushed raw material, which is connected to the inter-container (25) connected by high-pressure pump (26) to the hydrolyser (3). The hydrolyser (3) is connected to the heat source (27) via the waste gases conduit (28) to the stack(30). The hydrolyser is further connected via the overshooting pipe (12) to the counter-pressure head (29), connected via the pipe (4) to discharge the waste vapours to the condenser (5) designed with the pipe (6) of the cooling medium inlet and the pipe (7) of the cooling medium outlet and the pipe (8) to discharge waste condensate and not condensed gases, which is connected to the degasifier (9), to which the fan (11) and waste condensate pipe (10) , connected to the shower head (31), are connected. Expander (13) is connected via the boiled matter pump (14) to the fermenter 15.

4. Equipment for continuous hydrolysis of organic matter **distinguished by that** the cooler (19) of output raw mineral is connected after the pump (14) of boiled material, with the connected supply and discharge pipes (20, 21) of water heating circuit to the pre-heater (22) of input raw material and the connected pipe (23) for cooled material, brought out to the fermenter (15).

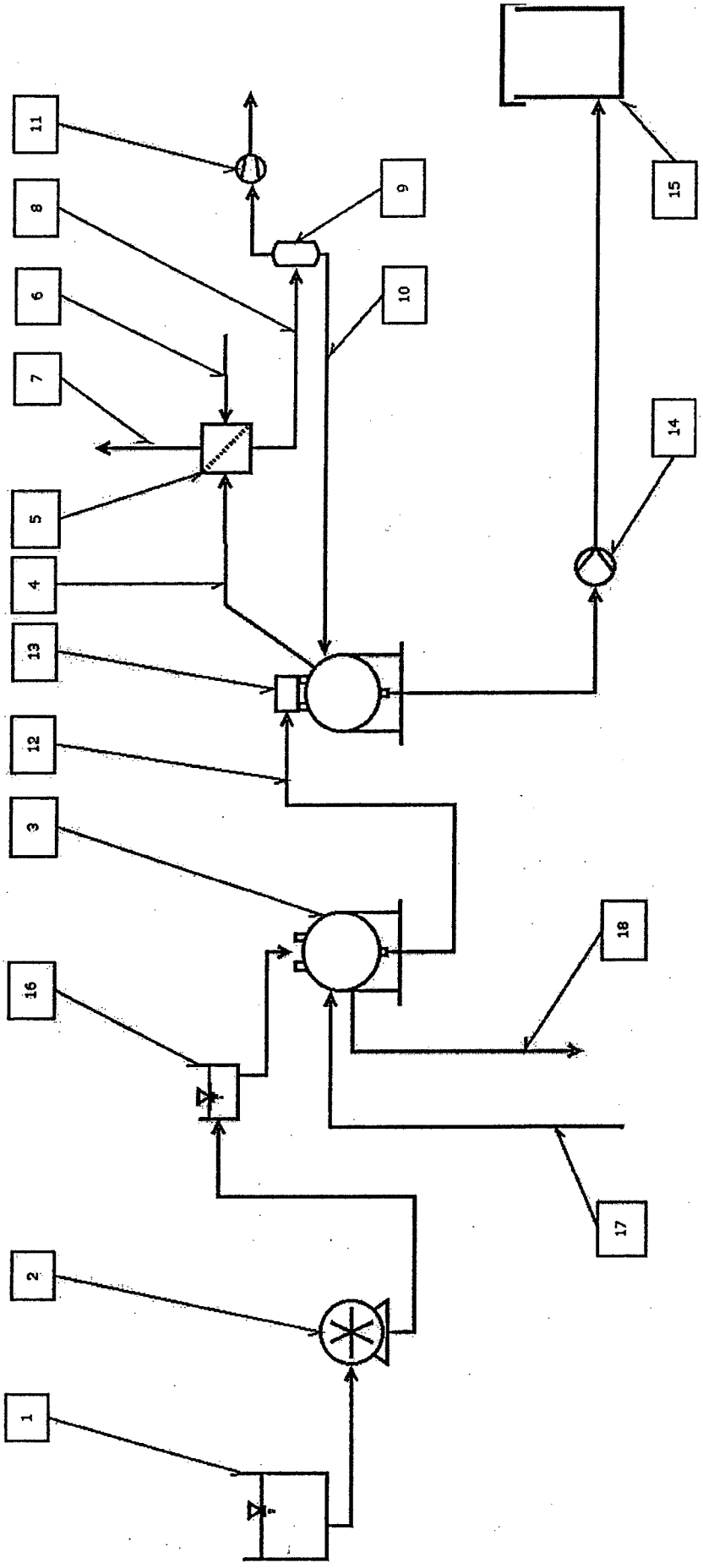

Fig. 1

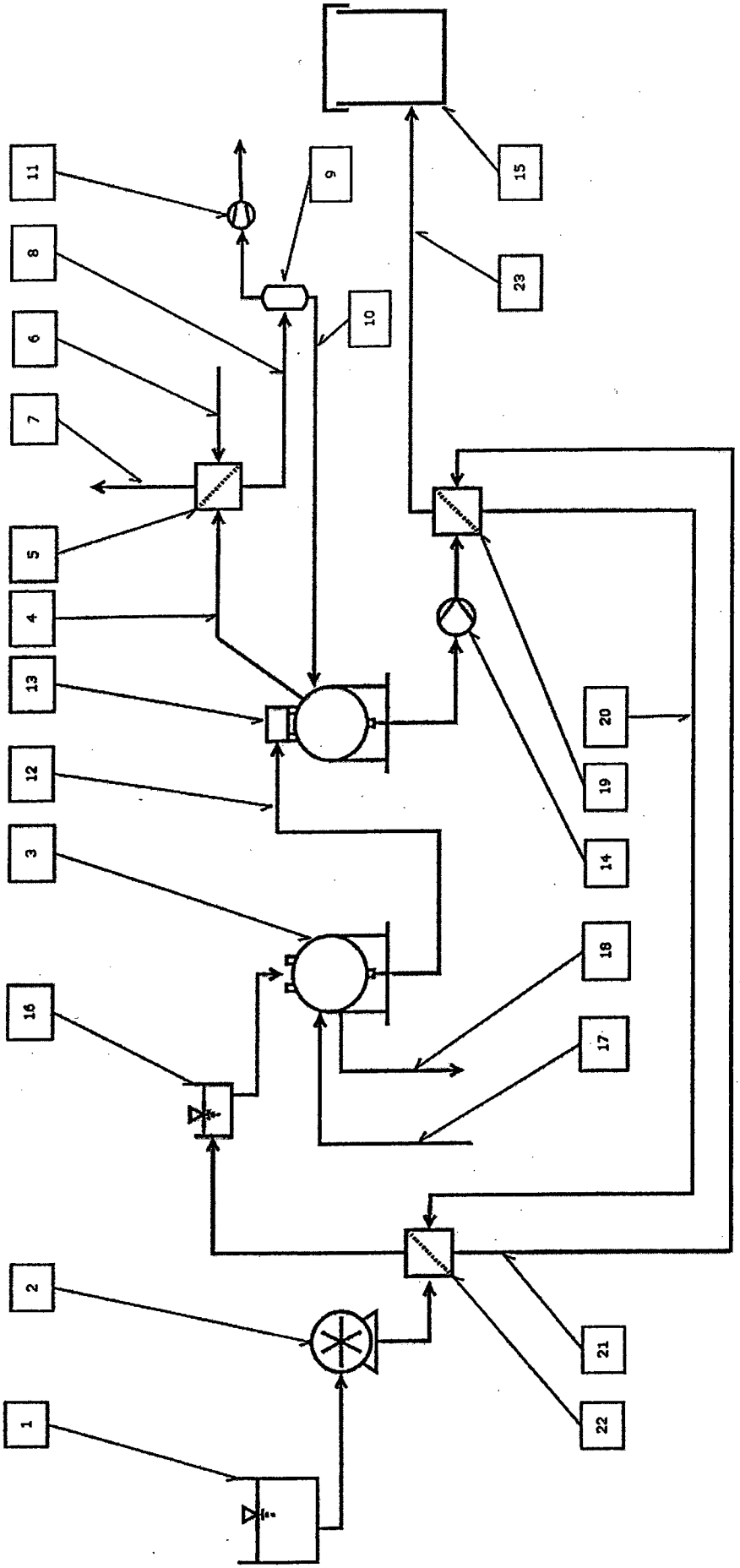

Fig. 2

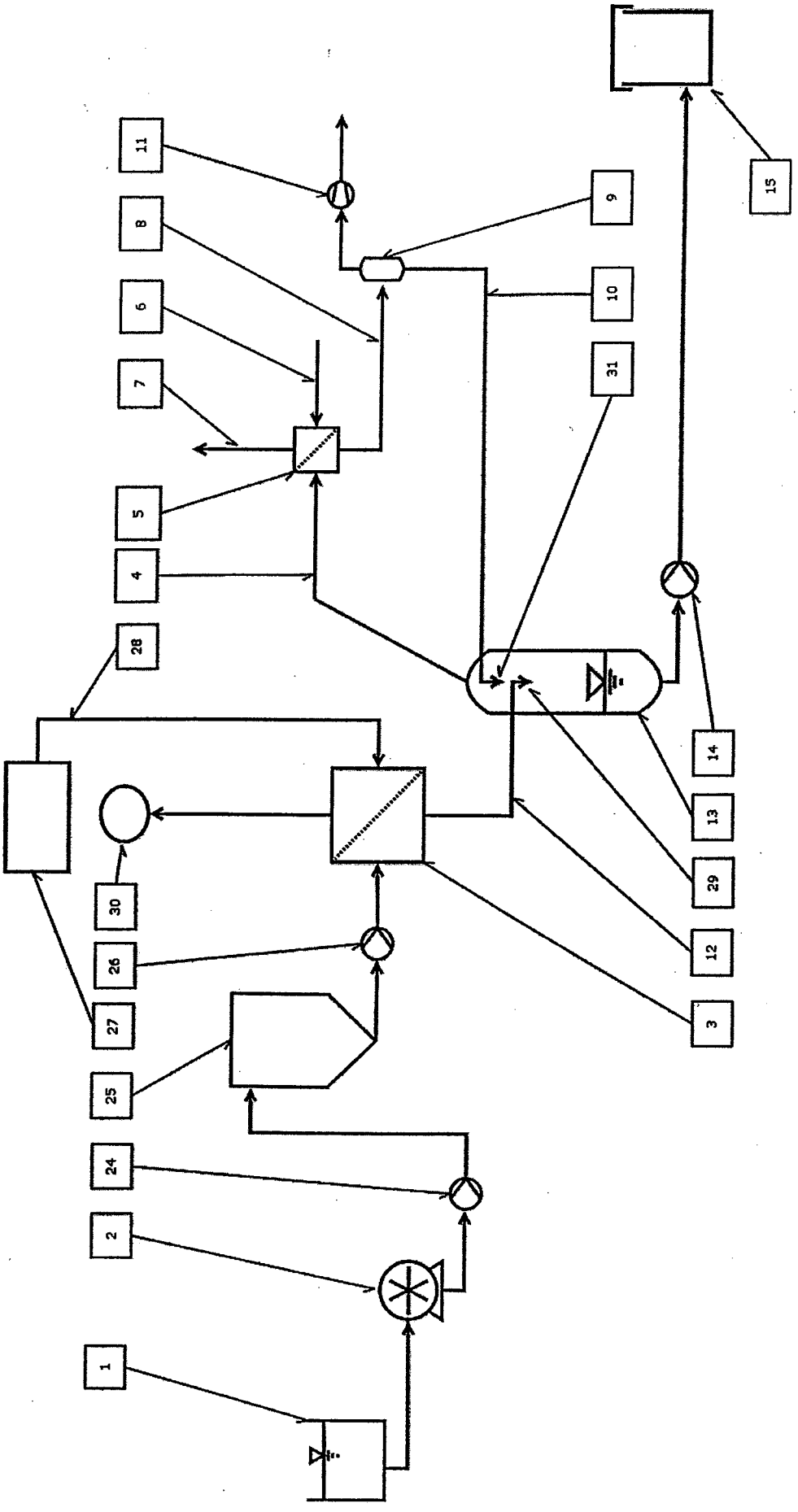

Fig. 3

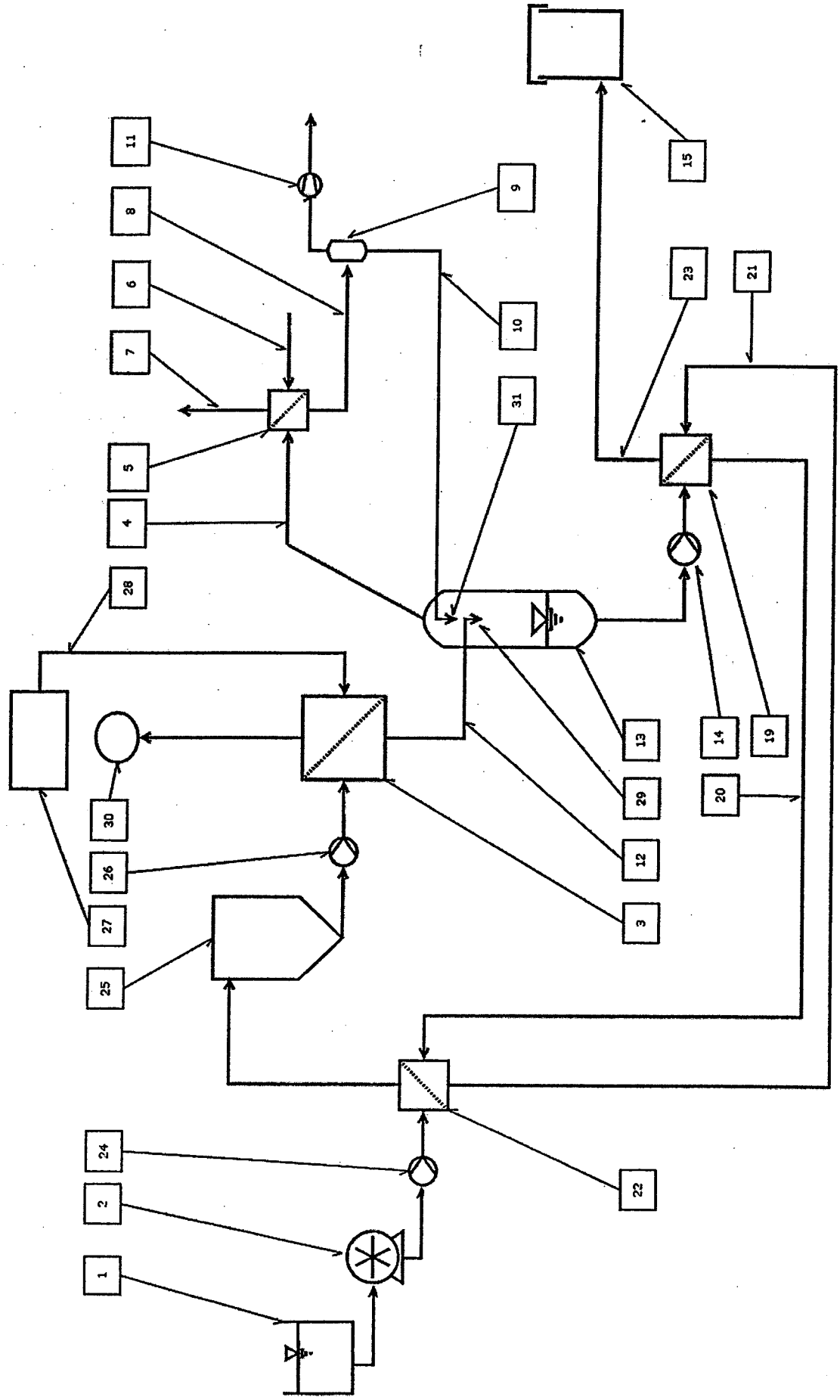

Fig. 4