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SUCTION VOLUME**(30) **Foreign Application Priority Data**

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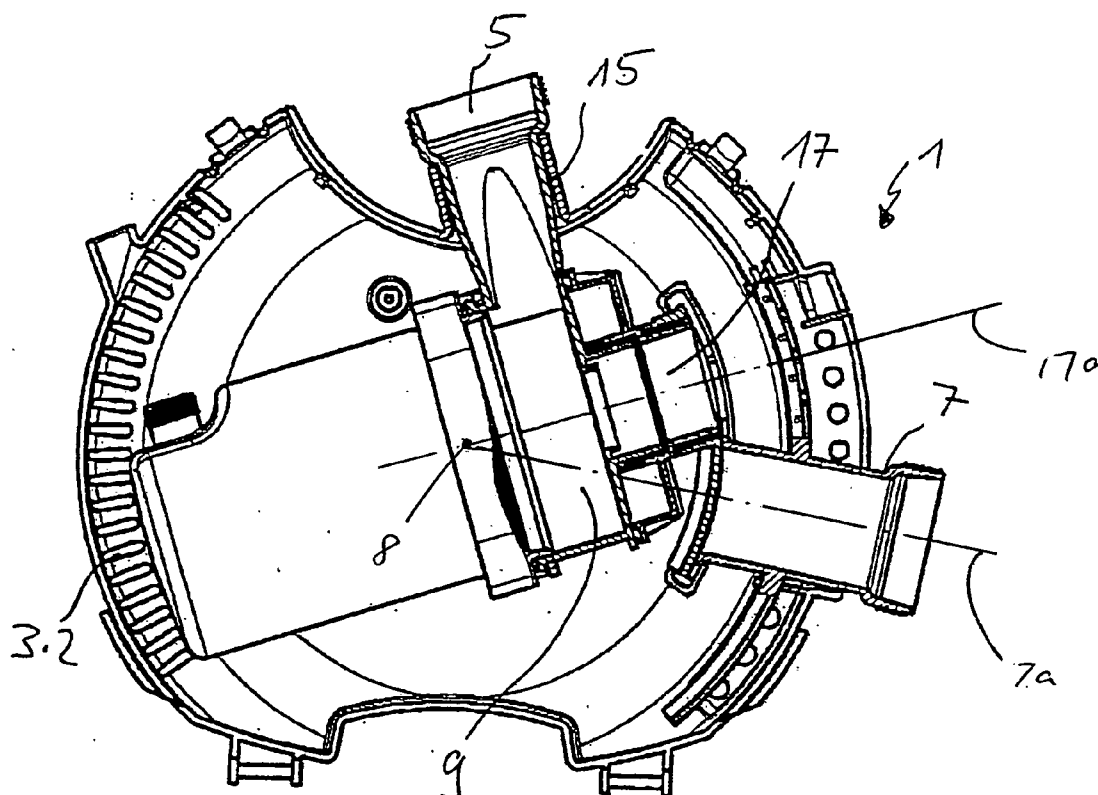
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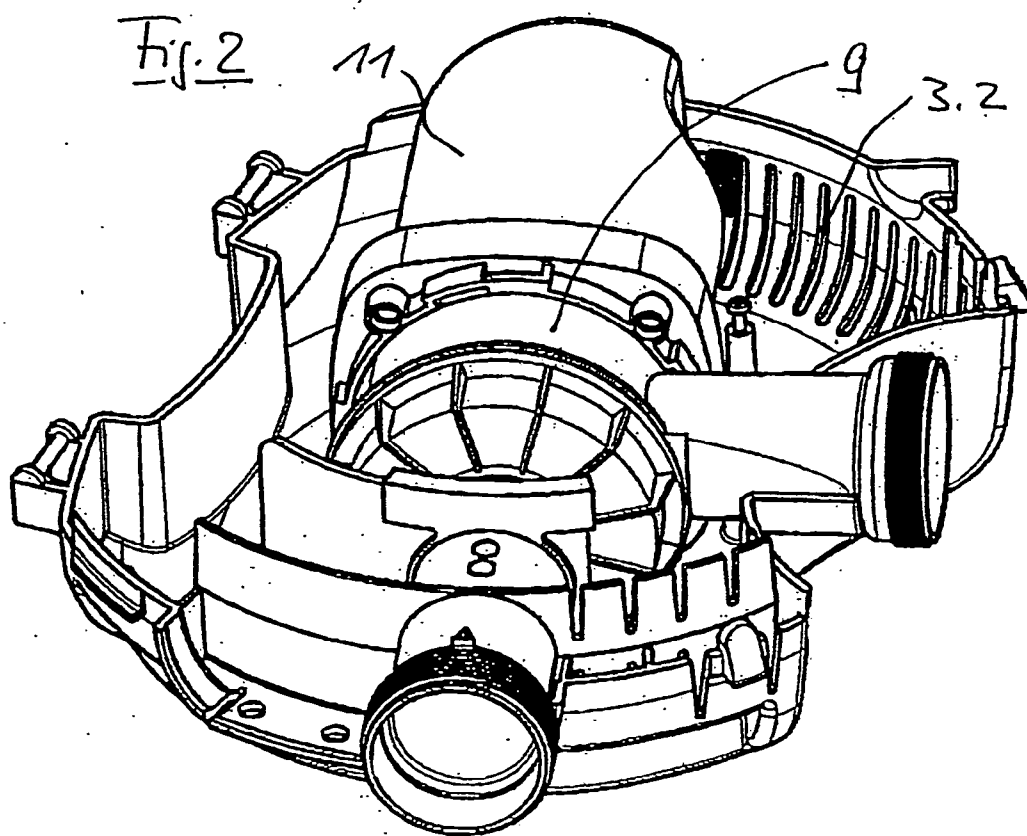
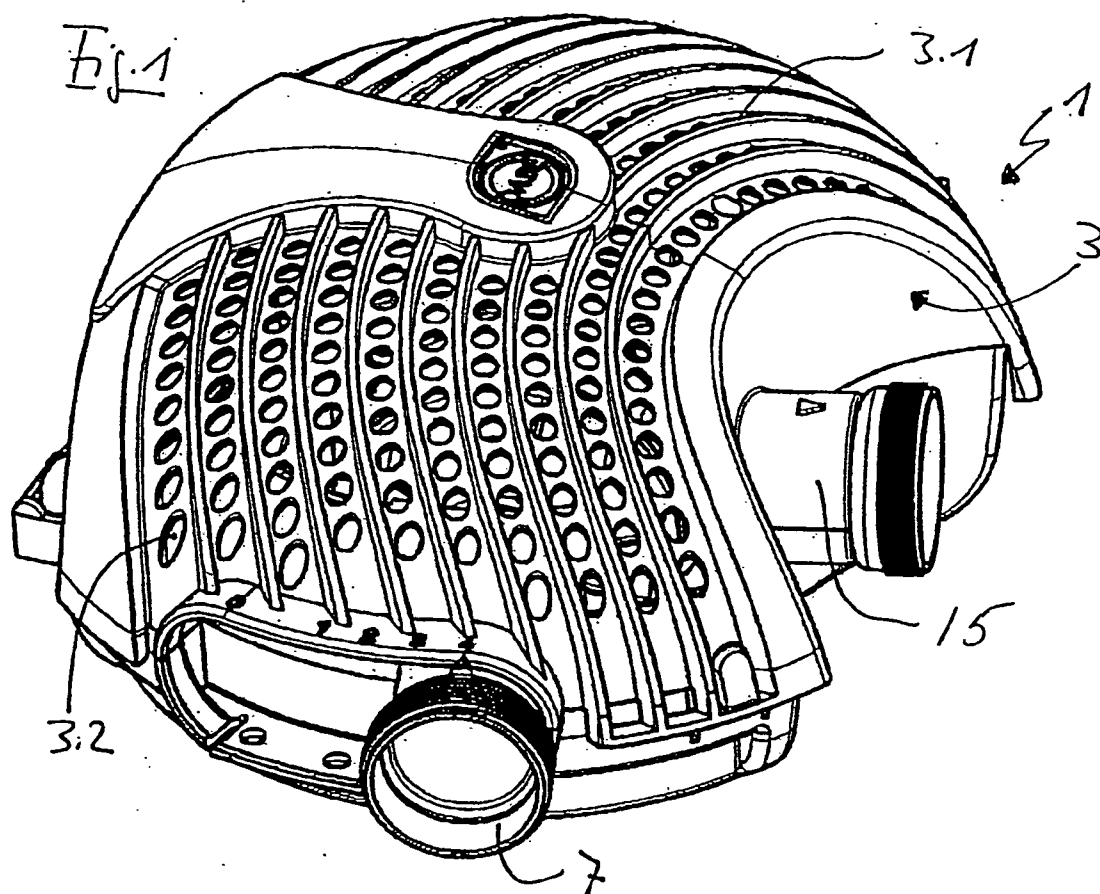
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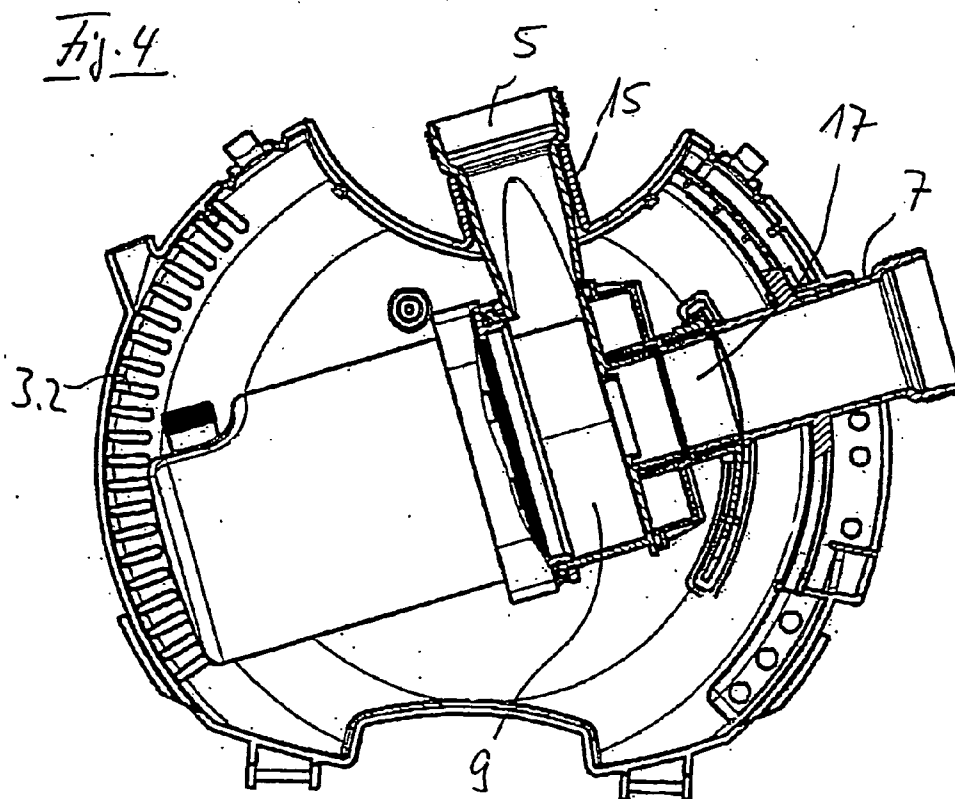
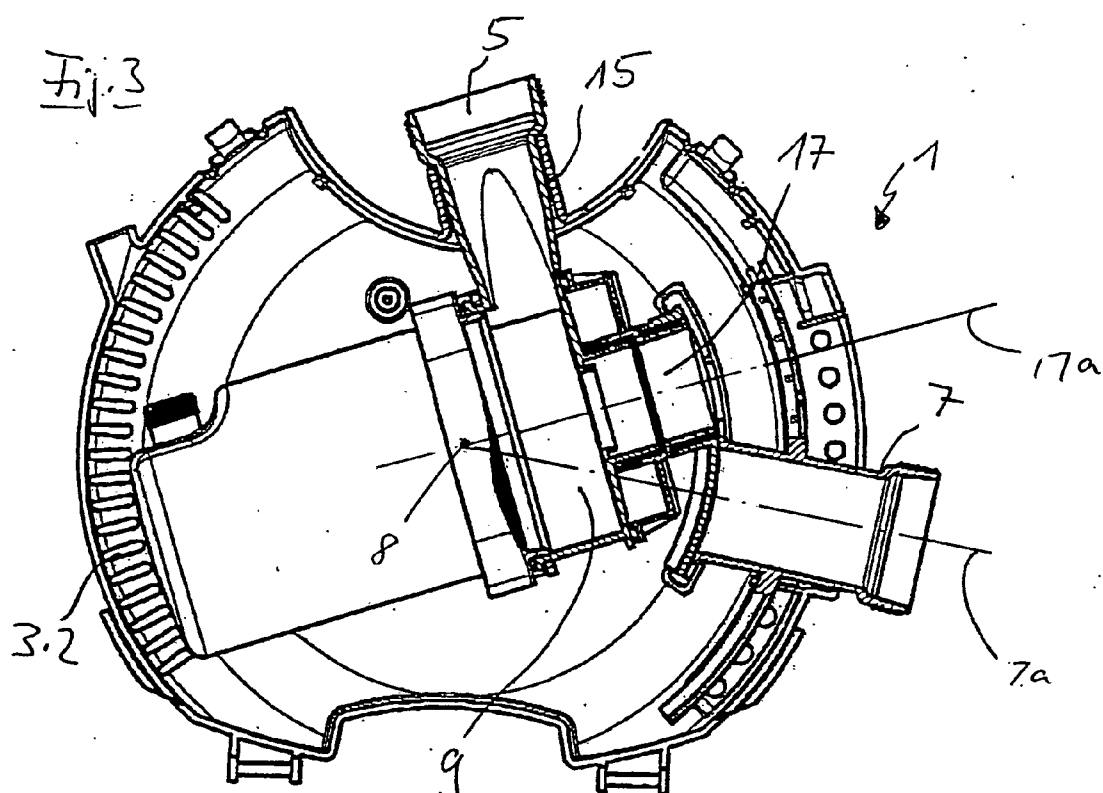
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A pond pump includes a housing having a discharge port and an intake area, the intake area having a plurality of openings. A pump device is installed in the housing. A suction port in the housing is in fluid communication with the discharge port via the pump device. An intake connector is supported by the housing and is movable relative to the suction port so that the percentage of suction volume of the suction port drawn in between the intake connector and the intake area can be varied. The pond pump also has a motor for driving the pump device, and a control unit for controlling the pump device and the motor.







POND PUMP HAVING A CONTROLLABLE SUCTION VOLUME

[0001] The present invention relates to a pond pump with a housing, a suction port, to which the intake area of a slotted housing shell is assigned, a discharge port, which is in fluid communication with the suction port by way of a pump device installed in the housing, a motor for operating the pump device, and a control unit for controlling the pump device and the motor.

[0002] Pond pumps of this type are generally known in the state of the art. They are positioned on the bottom of ponds or basins. The housing of the pond pump is designed as a coarse filter and has slots, through which water, but not leaves, small twigs, or other coarse particles, can pass and thus enter the housing. A pump device installed in the housing draws water in through a suction port situated behind the coarse filter shell and conveys the water through a discharge port and into a delivery line, which releases the water at its free end. In pond pumps of this type, only water from the bottom area of the pond or basin is drawn in and filtered on a regular basis. With a pump of this type it is not possible to draw in and filter water from the surface of the pond.

[0003] The task of the present invention is now to create a pond pump which can be used to draw water at a given suction volume either from the bottom area of a pond or basin and/or from the surface of the water, as desired.

[0004] The task is accomplished according to the invention in that the suction port is also provided with an intake connector, which is mounted adjustably with respect to the suction port so that the suction volume of the suction port can be split between the intake connector and the intake area.

[0005] When the inventive pond pump is used, an additional intake line starting near the surface of the water can be connected to the pond pump by way of the intake connector, so that water can be drawn from this area. The suction volume of the suction port can be split as desired between the bottom area of the pond and the area near the surface of the water.

[0006] An additional advantage of the present invention is that the intake connector can be adjusted between a first end position and a second end position. In the first end position, 100% of the suction volume is drawn in through the intake connector and 0% from the intake area, whereas, in the second end position, 0% of the suction volume is drawn in from the intake connector and 100% from the intake area.

[0007] Thanks to this adjustability of the suction volume, it is possible to draw water either only from the surface of the water or only from the bottom area or to split the suction volume between these extreme positions.

[0008] Another advantage is that the longitudinal axes of the intake connector and of the suction port lie on the same plane, and that the intake connector can thus be moved between the first end position and the second end position around an axis perpendicular to its longitudinal axis.

[0009] As a result of this measure, the pond pump can have a very compact design. The position to which the intake connector has been rotated, furthermore, is an indicator of

how the suction volume has been apportioned, which can thus be determined visually from the outside.

[0010] In this context, another advantage is that the longitudinal axes of the suction port and of the intake connector coincide in the first end position, whereas they are at an angle to each other in all other positions between the first end position and the second end position.

[0011] If the discharge port also has a discharge connector for connection to a delivery line, which is normally the case, the angle between the discharge connector and the suction connector also changes by the adjustment angle, which means again that the adjustment can be determined visually from a distance.

[0012] Additional advantages can be derived from the features of the additional subclaims.

[0013] An embodiment of the present invention is described in greater detail below on the basis of the drawing:

[0014] FIG. 1 shows a schematic perspective of a pond pump, which includes an upper housing shell, designed as a filter cover, a discharge connector, and an adjustable intake connector according to the present invention;

[0015] FIG. 2 shows a schematic perspective diagram of the pond pump according to FIG. 1 with the filter cover removed;

[0016] FIG. 3 shows a schematic diagram, from above, of the pond pump according to FIG. 2, with the filter cover removed and with the intake connector in a second end position, in which it is not in fluid communication with the suction port and water is therefore drawn in only via the intake area of the housing;

[0017] FIG. 4 shows a schematic diagram, from above, of the pond pump of FIG. 2, with the filter cover removed and with the intake connector in a first end position, in which it is in full fluid communication with the suction port and water is thus drawn in exclusively via the intake connector;

[0018] FIG. 5 shows a schematic perspective diagram of the inventive pond pump with filter cover removed, from the side;

[0019] FIG. 6 shows a schematic view, from above, of the pond pump according to FIG. 5; and

[0020] FIG. 7 shows a schematic cross-sectional view through a typical garden pond, with the inventive pond pump set up on the bottom, for the purpose of illustrating the two locally separated intake points, i.e., one on the bottom of the pond and the other at the surface of the water.

[0021] FIG. 1 shows a schematic diagram of a pond pump 1. The pond pump 1 has a housing 3, the upper housing shell of which is designed as a filter cover 3.1. The filter cover 3.1 has small openings or slots 3.2, which serve as a coarse filter. A discharge port 5 and an intake port 7 project from the circumference of the housing 3.

[0022] FIG. 2 shows the pond pump according to FIG. 1 without the filter cover 3.1. In the interior of the housing 3, a pump device 9 is installed, which is of conventional design and is therefore not described in further detail here. Small openings or slots 3.2, which again serve as a coarse filter, are also provided in the rear part of the lower half of the housing 3, the so-called bottom shell. Water can also be drawn from

a pond through these openings or small slots 3.2, so that these openings and small slots 3.2 form an intake area of the housing 3. The intake area itself is also referred to by the number 3.2 synonymously in the following. An electric motor 11 is installed in a water-tight manner behind the pump device 9.

[0023] FIG. 3 shows a schematic diagram of the pond pump 1 from above without the filter cover 3.1. A suction port 17, which is in fluid communication with the pump device 9, is provided in the housing 3. A discharge port 15 with the discharge connector 5 forms an angle to the suction port 17; preferably, it is perpendicular to the suction port 17. In the present embodiment, the longitudinal axes of the suction port 17 and of the discharge port 15 lie on the same plane. When the pond pump 1 is in an operating position, this common plane is preferably a horizontal plane. In other embodiments, however, this plane could be vertical when the pump is in its operating position or a plane between the horizontal and the vertical. It is also possible for the two longitudinal axes, i.e., that of the suction port 17 and that of the discharge port 15, not to be on the same plane.

[0024] The intake connector 7 is mounted in the housing 3 in such a way that its position with respect to the suction port 17 can be adjusted. In FIG. 3, the intake connector 7 is in a second end position, in which the intake connector 7 has no fluid communication with the suction port 17 at all. There is therefore no passage of fluid between the intake connector 7 and the suction port 17. In this position, the suction port 17 draws 100% of its suction volume through the intake area, i.e., through the slots 3.2 in the filter cover 3.1 and/or in the lower shell. The intake connector 7 can be brought into the end position shown in FIG. 4 in either a continuously variable manner or by way of defined intermediate positions. In the end position shown in FIG. 4, the pump device 9 draws 100% of its suction volume through the suction port 17 and the discharge connector 7. In this first end position of FIG. 4, no water is drawn in through the intake area 3.2.

[0025] FIGS. 3 and 4 show that the intake connector 7 can be moved along a circular path around an axis of rotation, which is perpendicular to the longitudinal axis of the intake connector 7. By adjusting the position of the intake connector 7 to a desired intermediate position between the first end position of FIG. 4 and the second end position of FIG. 3, the suction volume of the pump device 9 can be split between the intake connector 7 and the slots 3.2 of the filter cover 3.1.

[0026] Because of the free choice of position of the intake connector 7 with respect to the suction port 17, the suction volume of the pump device 9 via the intake connector can be adjusted between 0% and 100%. The difference between that setting and 100% is supplied via the intake area 3.2.

[0027] FIG. 5 shows the inventive pond pump schematically and in perspective from the side. On the right side of FIG. 5 are the intake slots 3.2, i.e., the intake area 3.2 formed by these slots.

[0028] FIG. 6 shows a view from above of the pond pump of FIG. 5. The top view of FIG. 6 is somewhat more detailed than the top views of FIGS. 3 and 4. The intake connector 7 can be shifted here to various predefined positions. For this purpose, latching points 19 are shown in FIG. 6, against which the intake connector 7 can be positioned. The intake

connector 7 has a thread 21, preferably an outside thread, to which an intake line can be connected. The pump device can be provided with a frost protection device (not shown), which protects it from freezing. The discharge port 5 also has a thread 23, preferably an external thread, to which a delivery line (not shown) can be connected. A cable connection 25 for an electric supply line is also provided in the housing 3.

[0029] The angle enclosed by the intake connector 7 and the discharge connector 5 in the first end position, that is, where 100% of the intake is through the intake connector 7, is 90°. The angle between the discharge connector 5 and the intake connector 7 in the second end position is between approximately 90° and 180°. The angle of the intake connector 7 to the longitudinal axis of the intake port 17 is 0° in the first end position and approximately 0-90° in the second end position.

[0030] FIG. 7 shows a sketch of the overall system in the form of a cross section of a pond. The inventive pond pump 1 is positioned on the bottom of the illustrated pond. A delivery line 35 is attached to the discharge connector 5 and leads to a pond filter outside the pond. An intake line 37 is attached to the intake connector 7; this intake line originates at a skimmer 47 at the surface of the water. Depending on the position of the intake connector 7 with respect to the suction port 17, the intake of dirty water from the bottom of the pond can be adjusted as desired to account for 0 to 100% of total pump output. In the same way, the intake of dirty water from the surface can be varied as desired to any value between 0 and 100%. It is therefore possible to select, for example, an intermediate position of the intake connector 7 with respect to the port 17 such that 70% of the total pump output is dedicated to the intake area 3.2, through which dirty water from the bottom is drawn in, and 30% of the total pump output is dedicated to the intake connector 7, through which dirty water from the surface is drawn in.

1.-10. (canceled)

11. A pond pump comprising:

a housing having a discharge port and an intake area, the intake area having a plurality of slots providing openings in the housing;

a pump device mounted in the housing and connected to the discharge port;

a suction port connected to the pump device so that the suction port is in fluid communication with the discharge port via the pump device;

an intake connector movably mounted to the suction port so that a percentage of suction volume drawn through the suction port can be variably split between the intake connector and the intake area; and

a motor for driving the pump device.

12. The pond pump of claim 11, wherein the intake connector is operable to be adjusted between a first position, where approximately 100% of the suction volume of the suction port is drawn from the intake connector, and a second position, where approximately 100% of the suction volume of the suction port is drawn from the intake area.

13. The pond pump of claim 12, wherein the intake connector is operable to be adjusted continuously between the first position and the second position.

14. The pond pump of claim 12, wherein the intake connector is operable to be adjusted to a predetermined intermediate position between the first position and the second position.

15. The pond pump of claim 12, wherein the intake connector has a fluid communication cross-section relative to the suction port which is progressively reduced when the intake connector is adjusted from the first position to the second position.

16. The pond pump of claim 12, wherein the intake connector has a first longitudinal axis, the suction port has a second longitudinal axis, and the first and second longitudinal axes are coplanar, and wherein the intake connector is operable to be adjusted between the first position and the second position around an axis perpendicular to the first longitudinal axis.

17. The pond pump of claim 16, wherein the first and second longitudinal axes coincide when the intake connector

is in the first position, and form an angle when the intake connector is not in the first position.

18. The pond pump of claim 17, wherein the angle is in the range of approximately 0° to approximately 90° .

18. The pond pump of claim 17, wherein the angle is in the range of approximately 0° to approximately 90° .

19. The pond pump of claim 11, wherein the intake connector is manually adjustable.

20. The pond pump of claim 11, further comprising a control unit connected to and controlling the pump device and the motor.

21. The pond pump of claim 20, wherein the control unit is also operable to control adjustment of the intake connector.

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