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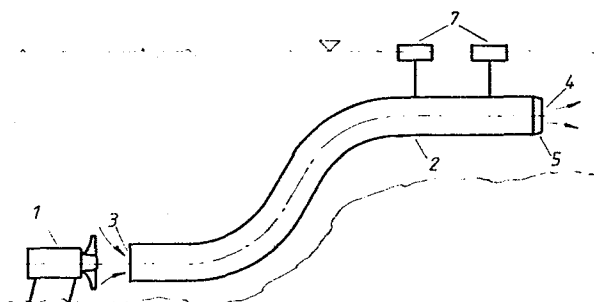
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(54) A method for transporting liquid.

(57) The invention concerns a method and a device for transport of liquid between two points having a very small or no mutual pressure difference.

The liquid is then brought into one end (3) of a hose (2) of a non-rigid material and flows out through the other end (4) which has a less area than the inlet (3), the hose being filled out by the inner over pressure.



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A METHOD AND A DEVICE FOR TRANSPORTING A LIQUID

This invention concerns a method and a device for transporting a liquid and more specifically to transport the liquid through a hose lowered into the liquid.

It is sometimes preferable to transport water from one area to another in the sea, a lake, a watercourse or the like. The purpose may be transport of warmer bottom water to keep the ice away during winter-time, water transport to fish-farms etc. This is then very easily obtained by help of a submersible flowing source arranged at the point from which the water should be transported, the water being brought to its destination through a pipe.

The problems by transporting liquid in this way are mainly economical. Big volumes of water shall be transported often long distances, which means that pipes of sheet metal or plastic will be very expensive. A direct flow generating by help of a propeller or a jet stream, means great losses and a non-wished dilution along the way.

According to the invention the transport problem is solved in a much cheaper way by bringing the water into one end of a hose of a non-rigid material, and out through the other end of the hose and/or through a number of holes in the hose wall, the hose being submersed in the water and being filled out by an inner over pressure caused by the total outlet area of the hose being smaller than its inlet area. As the hose is almost weightless relative its surrounding, the anchoring may be very simple, for instance by help of fishing net, weights and floats. The hose may also be so arranged that it, in its resting position, not stops the shipping. For instance the hose may be allowed to collapse because of its own weight or by help of special weights.

The invention is described more closely below with reference to the enclosed drawings.

Figure 1 shows a device according to the invention where bottom water is transported up to a point at the surface.

Figure 2 shows a device where bottom water is transported upwards and being let out through a number of holes for keeping the ice away along a pier.

Figure 3 shows a device where water is transported towards a net for fish breeding for increasing the water renewal and the temperature.

In the figures 1 stands for a flowing source, 2 a hose having inlet 3 and an outlet 4 with a throttle 5. 6 stands for holes in the hose wall and 7 are floats.

According to the invention a flowing source, for instance a submersible propeller mixer 1 is arranged at the point in the water from which it should be transported. At a given distance from the propeller the inlet 3 of the hose 2 is arranged, which distance depends on the diameters of the propeller and the hose resp. According to one embodiment of the invention the other end 4 of the hose is placed at the point to which the water should be transported, which end is somewhat throttled. This means that the hose, which is entirely submersed in the water, is filled out by the inner over pressure. As an alternative, if outflow is wished along a distance, a pier for instance, the hose is provided with a number of holes 6 in the wall, the outlet 4 then being throttled entirely or partly.

It is essential that the total outlet area always is somewhat smaller than the inlet area. The hose will then always be filled out, without the need of any special supports. The places where such supports are needed are only by the inlet and outlet resp. The material in the hose may be sail-cloth or soft plastic which is very cheap compared to pipes of a rigid material.

The method described above is thus only possible to use if the transport takes place in a hose submersed in liquid as then the hose is only influenced by small gravity forces.

C L A I M S

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- 1 A method to transport a liquid from one point to one or several others where there is none or a very small mutual pressure difference, characterized in, that the fluid is brought into one end of a hose of a non-rigid material and out through the other end of the hose and/or through a number of holes in the hose wall, the hose being submersed in the liquid and being filled out by an inner over pressure caused by the total outlet area of the hose being smaller than its inlet area.
- 2 A method according to claim 1, characterized in, that the liquid is brought to the inlet of the hose by help of a flowing source arranged some distance in front of the inlet.
- 3 A device for carrying out the method according to claim 1, characterized in, that it comprises a flowing source (1), for instance a propeller mixer, arranged at some distance in front of one end (3) of a hose (2) of a non-rigid material, the other end (4) of the hose having an opening with a smaller area than the inlet opening, alternatively entirely closed, the hose then having a number of radial openings (6) the total area of which is somewhat smaller than the inlet area.
- 4 A device according to claim 3, characterized in, that the flowing source (1) is arranged at such a distance from the inlet (3) of the hose that the jet stream generated by the source (1) is adapted to the chosen hose diameter, the latter preferably being essentially bigger than the original jet stream diameter.

- 5 A device according to claim 3, characterized in, that it comprises floats (7) for anchoring at an optimal depth under the surface.

