

pump may be actuated to pump liquid into said inlet and out of said outlet;

liquid chamber means having walls confining a liquid; one of the walls of said liquid confining means being movable;

gas chamber means having walls for confining gas; at least one wall of said gas chamber means being movable and biased to retract whereby said at least one wall of said gas chamber means may be moved by gas pressure and permitted to retract with a peak force of at least 5 ounces;

means for causing the movement of said at least one wall of said gas chamber to move said movable wall of said liquid chamber in a direction that expands said liquid chamber;

said at least one wall of said gas chamber being an elastomeric wall having greater elasticity than said movable wall;

said movable wall being formed of polytetrafluoroethylene;

said liquid chamber having a rigid wall; and said rigid wall having at least one surface of stainless steel facing said polytetrafluoroethylene wall.

6. A pump according to claim 5 further including means for providing communication between the space between said movable wall and said elastomeric wall while said elastomeric wall is expanding, whereby air between said movable wall and elastomeric wall may enter said air chamber and for preventing communication of the space between said elastomeric wall and movable wall while said elastomeric wall is contracting, whereby said movable wall is pulled with said elastomeric wall to expand said liquid chamber.

7. A pump in accordance with claim 6 in which said movable wall is capable of moving a predetermined distance within the range of 1 millimeter to 5 centimeters.

8. A pump in accordance with claim 7 in which the surface area of said movable wall capable of contacting said rigid wall of said liquid chamber is in a range of between 4 square centimeters and 5,000 square centimeters.

9. A pump in accordance with claim 8 in which the volume of said liquid chamber is in the range of between 0.4 cubic centimeters to 25 liters.

10. A pump in accordance with claim 9 in which the maximum force of elasticity of said elastomeric member is 5 ounces.

11. A pump in accordance with claim 10 in which said rigid wall is a cylinder; said movable inner wall is a cylinder inside and circumscribed by said rigid outer wall and said elastomeric wall is a cylinder inside and circumscribed by said movable wall.

12. A method of pumping comprising the steps of:

immersing a liquid inlet means of a pump in a liquid to be pumped;

connecting one end of a hose to a liquid outlet means of said pump;

placing the other end of said hose at a location to which the liquid is to be pumped;

connecting a hose to a gas communication means for permitting the entering and exiting of gas from an expandable gas expansion chamber having an elastomeric wall in said pump located in the center of a liquid chamber which has walls confining a liquid, wherein one of the walls of said liquid chamber is movable;

moving the movable wall of the liquid chamber toward an outer wall by expanding said gas chamber whereby the movement of said elastomeric wall moves said movable wall; moving the movable wall includes the step of moving a polytetrafluoroethylene against a rigid wall having at least one surface of stainless steel facing said polytetrafluoroethylene wall; and

providing communication between the space between said movable wall and said elastomeric wall while said elastomeric wall is expanding, whereby air between said movable wall and elastomeric wall may enter said air chamber and preventing communication of the space between said elastomeric wall and movable wall while said elastomeric wall is contracting, whereby said movable wall is pulled with said elastomeric wall to expand said liquid chamber.

13. A method in accordance with claim 12 further including the step of moving a predetermined distance within the range of 1 millimeter to 5 centimeters.

14. A method in accordance with claim 13 in which the step of moving includes the step of moving a wall having a surface area contacting said rigid wall of said liquid chamber in a range of between 4 square centimeters and 5,000 square centimeters.

15. A method in accordance with claim 14 in which the step of forcing liquid from said liquid chamber includes the step of forcing liquid in the range of between 0.4 cubic centimeters to 25 liters from said liquid chamber during each stroke of the pump.

16. A method according to claim 15 further including the steps of removing one of said inlet and outlet means, removing said expandable gas chamber from said housing, cleaning said pump, reassembling said pump and repeatedly expanding and contracting said chamber to pump liquid.

17. A method according to claim 16 in which said expandable chamber is pressurized starting when said liquid chamber is fully expanded to its maximum and vented to a lower pressure starting when said liquid chamber is at its minimum expansion.

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