



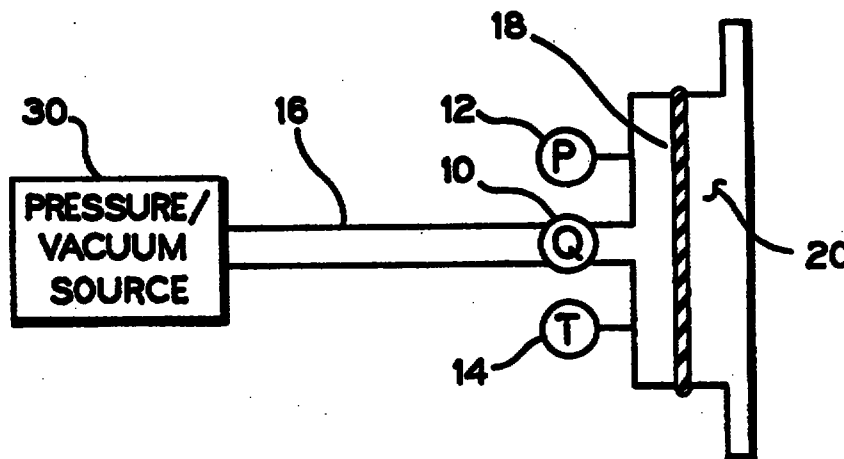
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: INSTANTANEOUS VOLUME MEASUREMENT SYSTEM AND METHOD FOR NON-INVASIVELY MEASURING LIQUID PARAMETERS

## (57) Abstract

A non-invasive technique and system is provided for measuring flow of liquid driven by a flexible diaphragm of a membrane pump (18). Flow, pressure and/or temperature of a gas, such as air, used to drive the pump (18) is continuously monitored. Instantaneous volume of liquid being pulled into or out of a chamber of the pump (18) can be calculated from measured values of the gas used to drive the pump (18). Sensors (10, 12 and/or 14) are used to measure values relating to the gas. The sensed parameters are concurrently monitored and continuously determine the amount of gas flowing to and from the diaphragm of the membrane pump (18) utilized to move liquid within a liquid pathway. The measurements may then be used to calculate the instantaneous flow rate of the liquid.



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