20. The membrane sensor of any preceding claim, further comprising a plurality of parallel vanes configured for directing fluid from the inlet of the first chamber to the outlet of the first chamber.

~~21. The membrane sensor of any preceding claim, wherein resistance of the resistance regulator is set equal to a resistance of the membrane when the membrane is new.~~

~~22.~~21. A method of detecting fouling in a fluid using only one membrane disposed between a first chamber and a second chamber, the method comprising:

permeating a fluid through the membrane from the first chamber to the second chamber;

obtaining a first pressure upstream of the membrane;

adjusting a second pressure downstream of the membrane by setting a resistance of a resistance regulator equal to a resistance of the membrane when the membrane is new;

obtaining the second pressure; and

determining a ratio between $(P_1 - P_2)$ and (P_2), P_1 being the first pressure and P_2 being the second pressure.

~~23.~~22. The method of claim ~~22~~21, further comprising obtaining a third pressure downstream of the resistance regulator, wherein determining the ratio between $(P_1 - P_2)$ and (P_2) comprises determining a ratio between $(P_1 - P_2)$ and $(P_2 - P_3)$, P_3 being the third pressure.

~~24.~~23. The method of claim ~~22~~ 21 or ~~23~~22, further comprising allowing some fluid received at an inlet of the first chamber to flow over the membrane to an outlet of the first chamber.

~~25.~~24. The method of any one of claims ~~22~~ 21 to ~~24~~23, further comprising permeating fluid through the membrane from the second chamber to the first chamber. **~~[this claim is to cover the backward flow provided by the embodiment of FIG. 16]~~**

~~26.~~25. The method of claim ~~25~~24, further comprising allowing some fluid received at an inlet of the second chamber to flow over the membrane to an outlet of the second chamber.

~~27.~~26. The method of any one of claims ~~22~~ 21 to ~~26~~25, further comprising controlling fluid flow rate to the first chamber.

~~28.~~27. The method of any one of claims ~~22~~ 21 to ~~27~~26, further comprising smoothening the first pressure.

~~29.~~28. The method of any one of claims ~~22~~ 21 to ~~27~~26, further comprising adjusting the first pressure.

~~30.~~29. The method of any one of claims 22 to 29, wherein the resistance of the membrane is a resistance of the membrane when the membrane has been fouled.

~~31.~~30. A treatment apparatus comprising the membrane sensor of any one of claims 1 to ~~21~~ 20 in fluid communication with an upstream membrane filtration apparatus, wherein fluid received on the membrane of the membrane sensor is an effluent of the upstream membrane filtration apparatus.

~~32.~~31. The treatment apparatus of claim ~~31~~30, further comprising a control unit configured for receiving the obtained first and second pressures, determining a ratio

between ($P_1 - P_2$) and (P_2), P_1 being the first pressure and P_2 being the second pressure, and correlating the ratio with one selected from the group consisting of: a failure of the upstream membrane filtration apparatus and a presence of a foulant in the effluent.

~~33.~~32. The treatment apparatus of claim ~~32~~31, wherein the control unit is further configured to selectably direct fluid alternately to the first chamber and the second chamber based on a pre-set interval or a pre-set value of the ratio between ($P_1 - P_2$) and (P_2).