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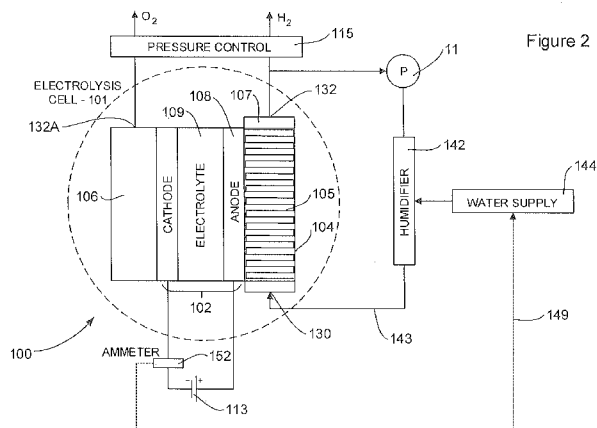


Figure 2

(57) Abstract: An electrolysis cell system (100) for producing hydrogen and oxygen from water comprising: at least one electrolysis cell (101) including a membrane electrode assembly (102) which comprises at least one pair of gas permeable electrodes (107, 109) comprising an anode (107) and a cathode (109), and an ion conductive electrolyte (108) arranged between each pair of anode (107) and cathode (109); an electrode gas space (104, 106) on the non-electrolyte side of each electrode (107, 109) comprising an anode gas space (104) and a cathode gas space (106), at least one electrode gas space (104) including an inlet (130) and an outlet (132); a recirculating loop (143) for recirculating at least a portion of produced oxygen product gas from the outlet (132) of at least one electrode gas space (104) to the inlet (130) of the respective electrode gas space (104) and through the respective electrode gas space (104); a water supply vessel (142) in fluid communication with the recirculating loop (143), the water supply vessel (142) vaporising water from a water supply (144) utilising heat of vaporisation provided by the respective product gas in the recirculating loop (143) and feeding said water vapour into the recirculating loop (143); and a heat transfer arrangement (105) for transferring heat between the membrane electrode assembly (102) and gas in the anode gas space (104) located in the electrode gas space (104) fluidly connected to the recirculating loop through the inlet and outlet thereof, wherein the heat transfer arrangement (105) is in contact with the membrane electrode assembly (102) and also allows for gas circulation between the membrane electrode assembly (102) and the respective gas space (104).