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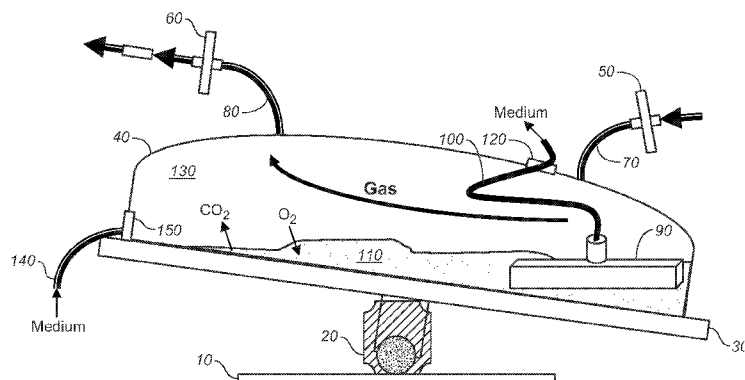


FIG. 1

(57) Abstract: An apparatus and method to maintain pH within a range conducive for cell growth in a bicarbonate-containing cell culture system without the addition of base. The method relies on the gas transfer characteristics of the bioreactor system to modulate the CO₂ transfer to and from the cell culture such that the pH of the cell culture can be maintained within a desired range.