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(54) Title: SCALEABLE INLINE BUFFER DILUTION SCHEME

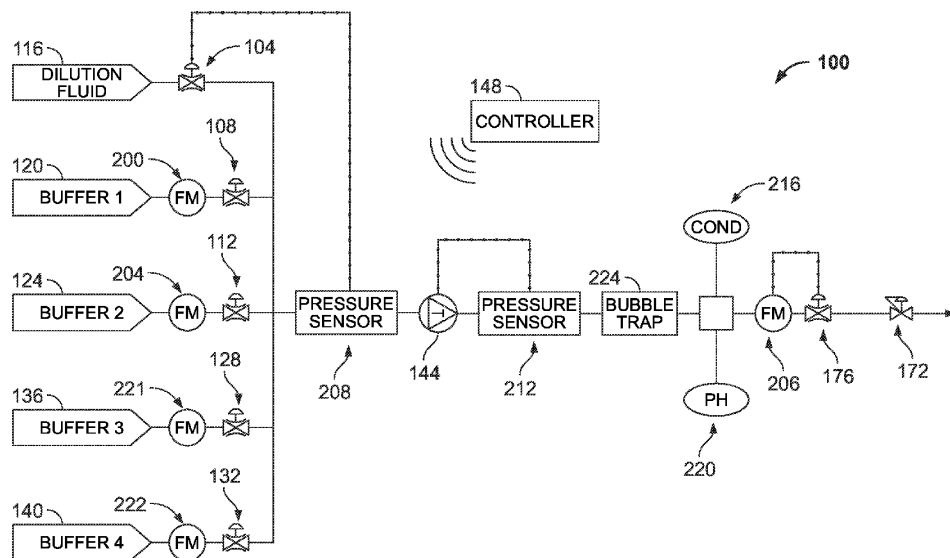


FIG. 1

(57) Abstract: An inline buffer dilution system is provided that includes a first flow control valve fluidly connected to a supply of diluent liquid, second and third flow control valves fluidly connected to supplies of a first buffer and a second buffer, respectively, and a mixing pump fluidly connected to the first, second, and third flow control valves and configured to mix an amount of the diluent liquid, the first buffer, and the second buffer to produce a diluted buffer solution. The system further includes a backpressure control valve configured to generate a backpressure that promotes mixing within the mixing pump, and a controller configured to control the backpressure based on the amount of the diluent liquid, the first buffer, and the second buffer being mixed in the mixing pump, such that the mixing pump yields a minimum mixing threshold across a range of fluid flows.

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