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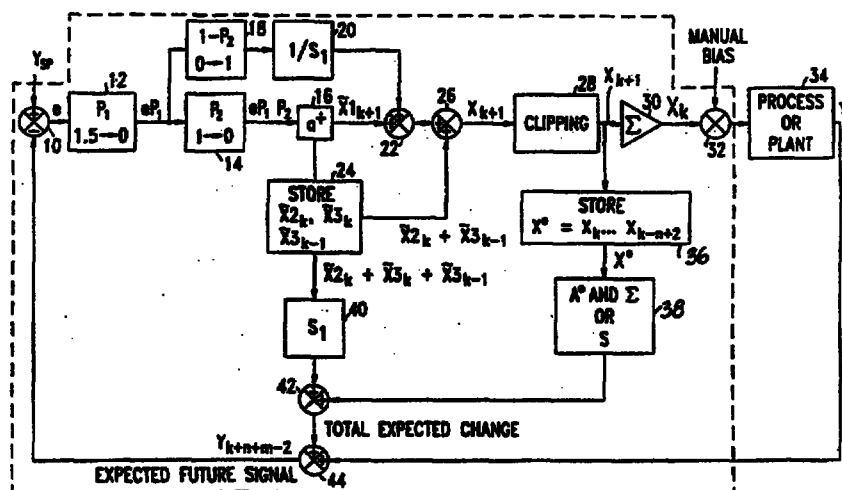
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(54) Title: MODEL PREDICTIVE CONTROL APPARATUS AND METHOD



(57) Abstract

A model predictive control apparatus and method for controlling the operation of a process (34) having a process input signal (X_k) and a process output signal (Y_k), which includes determining a predicted process output signal ($Y_{k+n+m+2}$) at a future steady state condition according to a process model, determining a steady state error signal according to the difference between the predicted process output signal and a desired set point signal (Y_{sp}), and determining a set of future process input change signals (x) requires to correct for the estimated steady state error (e) by providing at least one step response in the process output at a future time. The next net process input change is then applied according to the sum of the currently determined first element of the set of future process input change signals (x) summed with any future process input change signals that were previously calculated for the next process input change signal that is calculated according to this method. The model is expressed in velocity form. Process tuning parameters are available to dampen the net process input change as well as the currently determined first element of the process input change with respect to a process input change signal that is calculated according to the steady state error divided by the steady state process gain.