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[Continued on next page]

(54) Title: ANALYZING ULTRASONIC SIGNALS USING A DYNAMIC WINDOW FOR AN EARLY DETECTION OF SCALING IN WATER PROCESSING EQUIPMENT

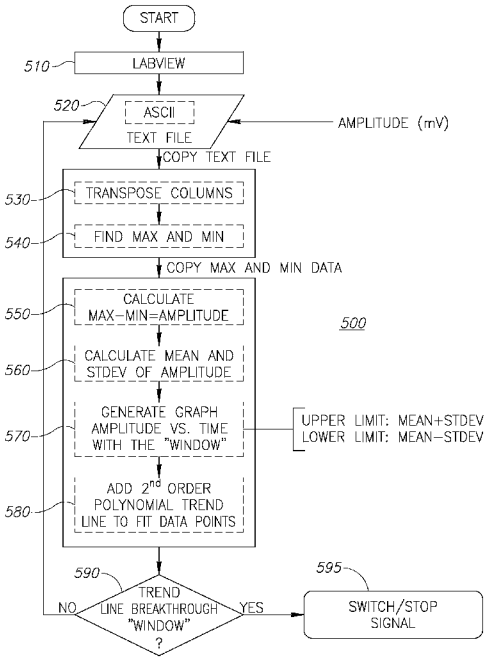


Figure 5

(57) Abstract: A method of detecting pre-conditions of scaling on internal surfaces of conduits of water processing equipment, is provided herein. The method includes: transmitting ultrasonic signals through the wall of the conduits; deriving data samples from received ultrasonic signals or reflections thereof; calculating a moving average of the scatter of the ultrasonic signals, over time, based on the data samples; applying a statistical operand to the moving average, to yield a statistical distribution metric; determining a dynamic window defined by: (i) an upper boundary being the moving average plus at least a fraction of the statistical distribution metric and (ii) a lower boundary being the moving average minus the at least a fraction of the statistical distribution metric; generating a trend line being a smooth fitting of the derived samples; and monitoring the trend line within the window to detect a crossover of the trend line at either of the boundaries.

WO 2012/007909 A2

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