An issue for quantitative inspection schemes (and to a lesser degree qualitative inspection schemes) is the calibration of the sensor or sensors that comprise the web inspection system such that it yields data about the web property of interest in units of measurement calibrated to be within some margin of error of a known standard.

Summary

According to an aspect of the present invention, there is provided a calibration system for a web inspection system used for monitoring a web of material, the calibration system comprising: at least one web sensor configured to receive signals indicative of a first characteristic of a first cross-web portion of the web of material, and provide first response signals representative of the first characteristic in a calibrated unit of measurement, said first cross-web portion being less than the width of the web of material; the web inspection system configured to receive signals indicative of the first characteristic from a second cross-web portion of the web of material and provide second response signals representative of the second cross-web portion; and, a sensor-to-inspection-system calibration module that converts the first response signals and second response signals to the frequency domain, and, for a first frequency range of interest, analyzes the frequency spectrum of the first and second response signals to provide a first frequency range correlation model which is then applied to the second response signals in the first frequency range to convert the second response signals in the first frequency range into the units of measurement of the first response signals.

Systems and methods for calibrating a web inspection system are disclosed. More specifically, systems and methods for real-time, on-line calibration of a web inspection system are disclosed. Generally, these systems and methods involve the use of a sensor up-web (or down-web) from the web inspection system, the sensor configured to accurately measure a web property of interest in calibrated units. Information provided from this sensor is converted to the frequency domain (using a Fourier transform, or similar), as is information provided from a web inspection system (for example a camera). A frequency range of interest is provided, and a correlation model created for this frequency range. This calibration model is then used to enable calibration constants for the web inspection system (within the frequency range) to be computed real-time or

near real-time, most often without interrupting the normal manufacturing process of the web. In various embodiments, this calibration system may eliminate the need for down-time or resource-intensive tests associated with traditional approaches to web inspection system calibration. Further, using the systems and methods disclosed herein, a web inspection system may be configured to provide quantitative information about a web property in engineering units. In some embodiments, quantitative information may be used to compare properties of web processes on different lines, or compare data across web inspection systems, or analyze the performance of the same web inspection system over single or multiple runs.