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(54) **Title:** IMAGE ANALYSIS OF HETEROGENEOUS MIXTURES
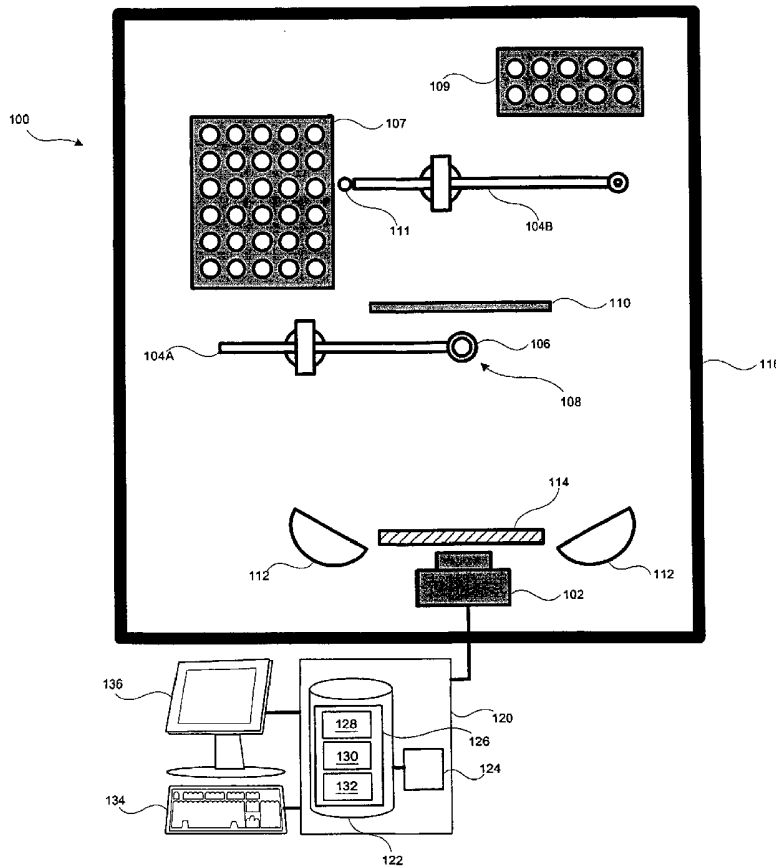
(57) **Abstract:** A system for analyzing a plurality of samples (202) containing a dispersion of one or more incompletely miscible components in a continuous fluid phase comprises a vial receptacle located at a first location, an image capturing device (102) directed at the first location, a light source (112) directed at the first location, and a programmable processor (124) operatively coupled to the image capturing device and configured to detect a behavior in a captured image of a sample. The programmable processor defines regions of interest in a captured image, generates an intensity profile for each region of interest, and detects the behavior based on the intensity profile. The programmable processor defines the regions of interest by detecting a sample boundary in a captured image and defining a region within the sample boundary. The programmable processor detects behavior by calculating a Laplacian or a derivative of the intensity profile for the region.