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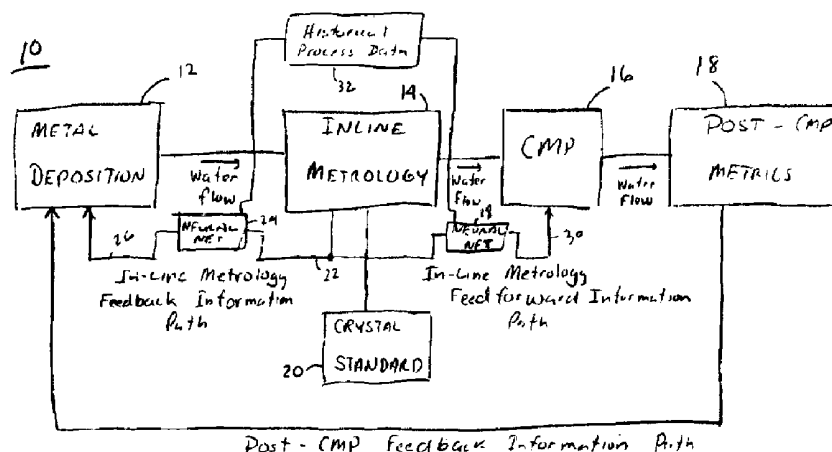
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(54) Abstract Title: **Feedforward and feedback control of semiconductor fabrication process using secondary electron microscopy and a focused ion beam system**

(57) A system (70) for crystallography including a sample holder (74), an electron source (76) for generating an electron beam, and a scanning actuator (80) for controlling the relative movement between the electron beam and the crystalline sample, the scanning actuator being controllable for directing the electron beam at a series of spaced apart points within the sample area. The system also includes an image processor (84) for generating crystallographic data based upon electron diffraction from the crystalline sample and for determining whether sufficient data have been acquired to characterize the sample area. The system further includes a controller (86) for controlling the scanning actuator to space the points apart such that acquired data is representative of a different grains within the crystalline sample. In other embodiments, the invention includes one or more ion beams (178, 188) for crystallography and a combination ion beam/electron beam (218, 228). Crystallographic metrology data may be grain size and orientation which are feedback and feed-forwarded to a deposition station (such as a CVD station) and to a chemical-mechanical planarization station respectively for in-line control of the fabrication process of a semiconductor.



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(58) Field of Search by ISA:

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