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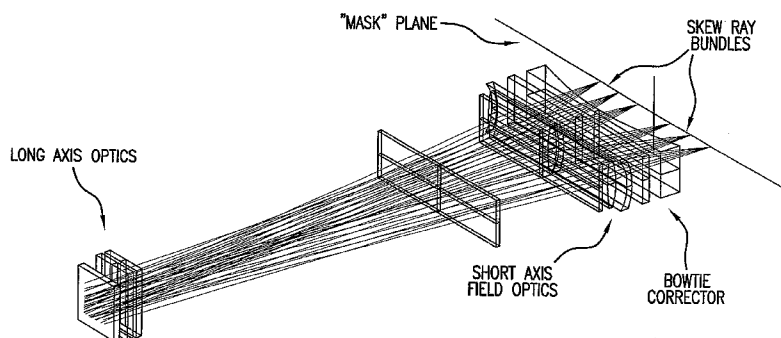
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(54) Title: LASER THIN FILM POLY-SILICON ANNEALING OPTICAL SYSTEM



(57) Abstract: A high energy, high repetition rate workpiece surface heating method and apparatus are disclosed which may comprise a pulsed XeF laser operating at or above 4000 Hz and producing a laser output light pulse beam at a center wavelength of about 351 nm; an optical system narrowing the laser output light pulse beam to less than 20 μm in a short axis of the laser output light pulse beam and expanding the laser output light pulse beam to form in a long axis of the beam workpiece covering extent of the long axis; the optical system including a field stop intermediate the laser and the workpiece; the workpiece comprising a layer to be heated; wherein the optical system focuses the laser output light pulse beam at a field stop with a magnification sufficient to maintain an intensity profile that has sufficiently steep side walls to allow the field stop to maintain a sufficiently steep beam profile at the workpiece without blocking the beam profile at too high an intensity level 2. The apparatus may also have a high average power in the laser output light pulse beam as delivered to the workpiece and a linebow correction mechanism in a short axis optical assembly. The linebow correction mechanism may comprise a plurality of weak cross cylinders. The system may comprise a catadioptric projection system. The line width due to laser diffraction and divergence may be less than geometric limitations. The system may project adjacent peaks of the nominal XeF spectrum to improve overall depth of focus through the separate center wavelengths of each respective adjacent peak having a different focal plane at the workpiece. The system may comprise a linebow is correction mechanism within a field stop optical assembly correcting linebow at the field stop plane and within a workpiece projection optical assembly correcting linebow at the workpiece plane.



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