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ABSTRACT

A high-precision scanning positioning system with magnification and orthogonality correction. A scanning position system, such as a microlithographic system, has a mask fine stage and a plate fine stage mounted on a first stage that moves at a constant velocity during exposure. By moving one fine stage relative to the other fine stage in the same or opposite direction of the scan during the exposure of the plate, an increase or decrease in magnification may be achieved. Likewise, by moving one fine stage relative to the other fine stage perpendicular to the direction of the scan during the exposure, a change in orthogonality may be achieved, and by rotating one fine stage relative to the other, correction of any rotation error may be achieved. A position control apparatus controls the motion of the fine stage relative to the other fine stage, such that the scanning position system can simultaneously correct synchronous error between the fine stages and reduce settling time while changing the magnification and orthogonality.