

CORRECTION OF OFF-AXIS TRANSLATION OF OPTICAL ELEMENTS IN AN OPTICAL ZOOM ASSEMBLY

ABSTRACT OF THE DISCLOSURE

A laser beam may be used to provide a virtual reference axis of travel for the in-axis direction of motion of lenses in a zoom assembly to be positioned during a zoom operation. The virtual reference axis is projected along the optical axis, parallel to existing mechanical lens slides. The virtual reference axis passes through an aperture on each of the lens assemblies, and is sampled by a set of optics and detectors on each of the lens assemblies. The optics and detectors are arranged such that any change in the position of a lens cell within a lens assembly relative to the virtual reference axis is sensed and corrected using a feedback signal to a positioning motor. Since the same virtual reference axis is used for each lens in the zoom assembly, each lens can be independently corrected for off-axis position errors to very high precision.

FIGURE 6