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Berens et al.

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(54) **LITHOGRAPHIC APPARATUS AND METHOD**

(56) **References Cited**

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CPC **G01B 11/14** (2013.01); **G03F 7/70008** (2013.01); **G03F 7/70775** (2013.01)

(58) **Field of Classification Search**
CPC . G01B 11/14; G03F 7/70008; G03F 7/70775; G01D 5/00

See application file for complete search history.

(57) **ABSTRACT**

A displacement measurement system comprising at least one retro reflector and a diffraction grating. Said displacement measurement system is constructed and arranged to measure a displacement by providing a first beam of radiation to the measurement system, wherein the diffraction grating is arranged to diffract the first beam of radiation a first time to form diffracted beams. The at least one retro reflector is arranged to subsequently redirect the diffracted beams to diffract a second time on the diffraction grating. The at least one retro reflector is arranged to redirect the diffraction beams to diffract at least a third time on the diffraction grating before the diffracted beams are being recombined to form a second beam. And the displacement system is provided with a sensor configured to receive the second beam and determine the displacement from an intensity of the second beam.

17 Claims, 4 Drawing Sheets

