**PCT** WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7: G01N 21/63, 29/24 — A1

(11) International Publication Number: WO 00/23790

(43) International Publication Date: 27 April 2000 (27.04.00)

(21) International Application Number: PCT/EP99/08231

(22) International Filing Date: 21 October 1999 (21.10.99)

(30) Priority Data:
09/176,174 21 October 1998 (21.10.98) US

(71) Applicant: KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL–5621 BA Eindhoven (NL).

(72) Inventors: FUCHS, Martin; Prof. Holstlaan 6, NL–5656 AA Eindhoven (NL). JOFFEE, Michael; Prof. Holstlaan 6, NL–5656 AA Eindhoven (NL). BANET, Matt; Prof. Holstlaan 6, NL–5656 AA Eindhoven (NL).

(74) Agent: COBBEN, Louis, M., H.; Internationaal Octrooibureau B.V., Prof. Holstlaan 6, NL–5656 AA Eindhoven (NL).

(81) Designated States: CN, JP, KR, SG, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published
*With international search report.*
*Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.*

(54) Title: IMPROVED METHOD AND APPARATUS FOR FILM–THICKNESS MEASUREMENTS

(57) Abstract

Described is a method and apparatus for measuring a property of a sample by: irradiating a portion of the sample with an excitation pattern having at least one spatial phase and spatial period; diffracting a portion of a probe beam off a surface of the sample; detecting the diffracted portion of the probe beam with an optical detector to generate a light–induced signal; and processing the light–induced signals to determine a property of the sample. By adjusting the spatial phase of the excitation pattern and repeating the irradiating, diffracting and detecting steps to generate at least one additional light–induced signal the method is considerably improved.

