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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : G11B 5/55

A1

(11) International Publication Number: WO 98/49677

(43) International Publication Date: 5 November 1998 (05.11.98)

(21) International Application Number: PCT/US97/17655

(22) International Filing Date: 30 September 1997 (30.09.97)

(30) Priority Data:

60/045,179	30 April 1997 (30.04.97)	US
08/902,566	29 July 1997 (29.07.97)	US

(81) Designated States: DE, GB, JP, KR, SG.

Published
With international search report.

(71) Applicant: SEAGATE TECHNOLOGY, INC. [US/US]; 920 Disc Drive, P.O. Box 66360, Scotts Valley, CA 95067-0360 (US).

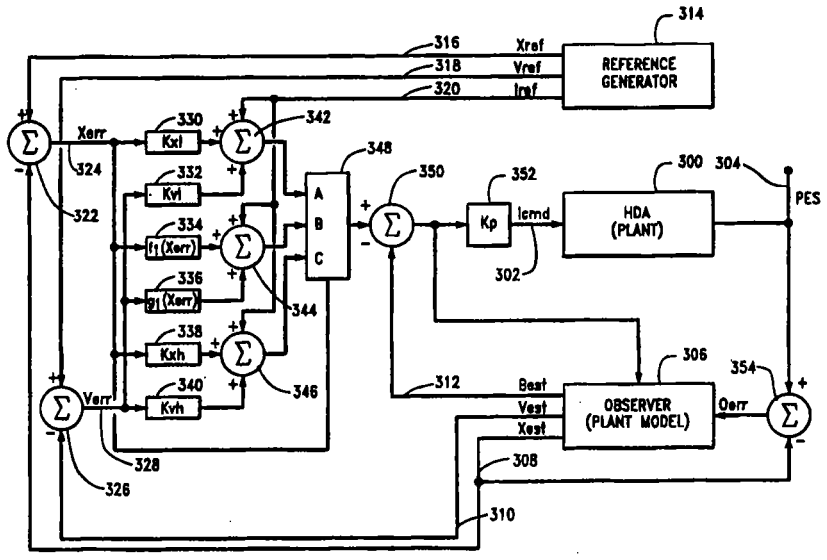
(72) Inventors: LIU, Zhiqiang; 5444 North Meridian Avenue, Oklahoma City, OK 73112 (US). FUNCHES, Otis, L.; 7331 Skylark Lane, Oklahoma City, OK 73162 (US). HAMPSHIRE, Randall, D.; R.R. #1, Box 142, Agra, OK 74824 (US).

(74) Agents: McCARTHY, Randall, K.; McCarthy, Free & McCarthy, Suite 250, 101 Park Avenue, Oklahoma City, OK 73102 (US) et al.

162162

G00001

(54) Title: OBJECT POSITIONING USING DISCRETE SLIDING MODE CONTROL WITH VARIABLE PARAMETERS



(57) Abstract

Apparatus and method for improving vibration and mechanical shock response of a control system through the use of discrete-time sliding mode control with variable parameters are disclosed. A servo circuit (150) for positioning a head (118) of a disc drive (100) includes a reference generator (314, 414) generating position and velocity references, an observer (306, 406) generating position and velocity estimates, and error circuitry (322, 326, 422, 426) for determining position and velocity errors therefrom. Gain circuitry (330, 332, 334, 336, 338, 340, 430, 432) applies variable position and velocity gains to the position and velocity errors, respectively, the position and velocity gains varying with respect to at least the magnitudes of the position errors.

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