9705704-6

RTMP COPY

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : G11B 21/08, 27/30 — A1

(11) International Publication Number: WO 96/41342

(43) International Publication Date: 19 December 1996 (19.12.96)

(21) International Application Number: PCT/US95/06255

(22) International Filing Date: 7 June 1995 (07.06.95)

(71) Applicant *(for all designated States except US)*: SEAGATE TECHNOLOGY, INC. [US/US]; 920 Disc Drive, Scotts Valley, CA 95067-0360 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: VOLZ, LeRoy, Allen [US/US]; 11922 Doral Avenue, Northridge, CA 91326 (US). VARANASI, Chandra, Chuda [IN/US]; 311 Country Club Drive #4, Simi Valley, CA 93065 (US). STONE, Dennis, Carl [US/US]; 3630 St. Elizabeth Road, Glendale, CA 91209 (US).

(74) Agent: CHASIN, Lawrence, C.; Kinney & Lange, P.A., Suite 1500, 625 4th Avenue South, Minneapolis, MN 55415-1659 (US).

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

Published
With international search report.

(54) Title: RATE n/(n+1) CODE FOR EMBEDDED SERVO ADDRESS ENCODING

(57) Abstract

A track address pattern embedded in the servo zones of a storage medium for representing a track address identification having a binary bit length "n". The track addresses pattern embedded in the medium is recoded from a Gray-code representation of the track address identification and has a code rate of n/(n+1), where $n \geq 2$. The recoded track address pattern (or codeword) is modeled from a Gray-code representation wherein a plurality of bit cells corresponding to a track address of the data storage apparatus are recoded to include a parity bit selected to maintain a selected parity for the track address pattern. More particularly, when a "1" occurs in the same bit cell location in two adjacent track address patterns, then the parity on "1"s up until the same bit cell location is the same for both of the m^{th} and the $(m-1)^{th}$ track address patterns and for the m^{th} and the $(m+1)^{th}$ track address patterns. Furthermore, the codewords provide that the bit cells of an m^{th} track address differ from the bit cells of an $(m-1)^{th}$ track address in exactly two bit cell locations, and that the bit cells of an m^{th} track address differ from the bit cells of an $(m+1)^{th}$ track address in exactly two bit cell locations. One of the positions in which neighboring codewords differ is the parity bit position.

Track Number	Gray Code Pattern				Encoded Address Pattern				
	b_1	b_2	b_3	b_4	b_2	b_4	Parity Bit (X)	b_3	b_1
1	0	0	0	0	0	0		0	0
2	0	0	0	1	0	1		0	0
3	0	0	1	1	0	1		1	0
4	0	0	1	0	0	0		1	0
5	0	1	1	0	1	0		1	0
6	0	1	1	1	1	1		1	0
7	0	1	0	1	1	1		0	0
8	0	1	0	0	1	0		0	0
9	1	1	0	0	1	0		0	1
10	1	1	0	1	1	1		0	1
11	1	1	1	1	1	1		1	1
12	1	1	1	0	1	0		1	1
13	1	0	1	0	0	0		1	1
14	1	0	1	1	0	1		1	1
15	1	0	0	1	0	1		0	1
16	1	0	0	0	0	0		0	1

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgystan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic			SE	Sweden
CG	Congo	KR	Republic of Korea	SG	Singapore
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LR	Liberia	SZ	Swaziland
CS	Czechoslovakia	LT	Lithuania	TD	Chad
CZ	Czech Republic	LU	Luxembourg	TG	Togo
DE	Germany	LV	Latvia	TJ	Tajikistan
DK	Denmark	MC	Monaco	TT	Trinidad and Tobago
EE	Estonia	MD	Republic of Moldova	UA	Ukraine
ES	Spain	MG	Madagascar	UG	Uganda
FI	Finland	ML	Mali	US	United States of America
FR	France	MN	Mongolia	UZ	Uzbekistan
GA	Gabon	MR	Mauritania	VN	Viet Nam