



US005731768A

# United States Patent [19]

[11] Patent Number: 5,731,768

Tsang

[45] Date of Patent: Mar. 24, 1998

[54] METHOD AND APPARATUS FOR IMPLEMENTING CODES WITH MAXIMUM TRANSITION RUN LENGTH

[75] Inventor: Kinhing P. Tsang, Plymouth, Minn.

[73] Assignee: Seagate Technology, Inc., Scotts Valley, Calif.

[21] Appl. No.: 594,987

[22] Filed: Jan. 31, 1996

[51] Int. Cl.<sup>6</sup> ..... H03M 7/46

[52] U.S. Cl. .... 341/59

[58] Field of Search ..... 341/59, 58, 50, 341/93, 94, 82

## [56] References Cited

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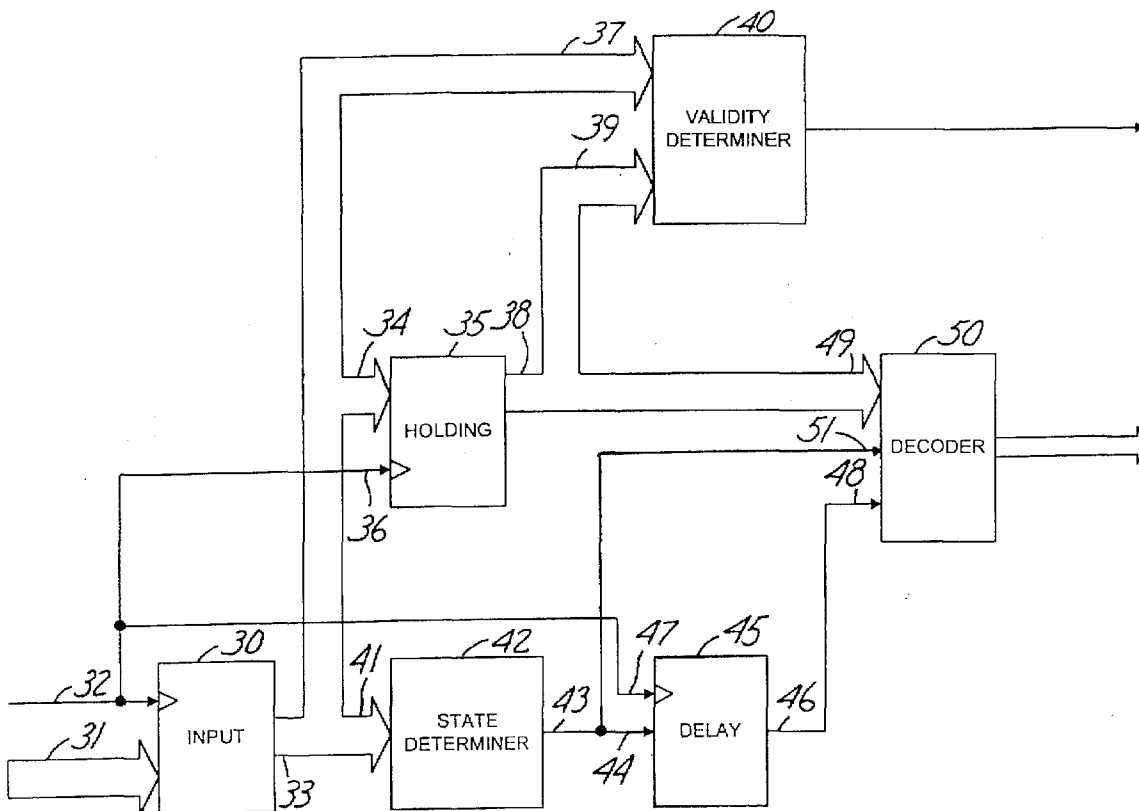
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Primary Examiner—Brian K. Young  
Attorney, Agent, or Firm—Kinney & Lange, P.A.

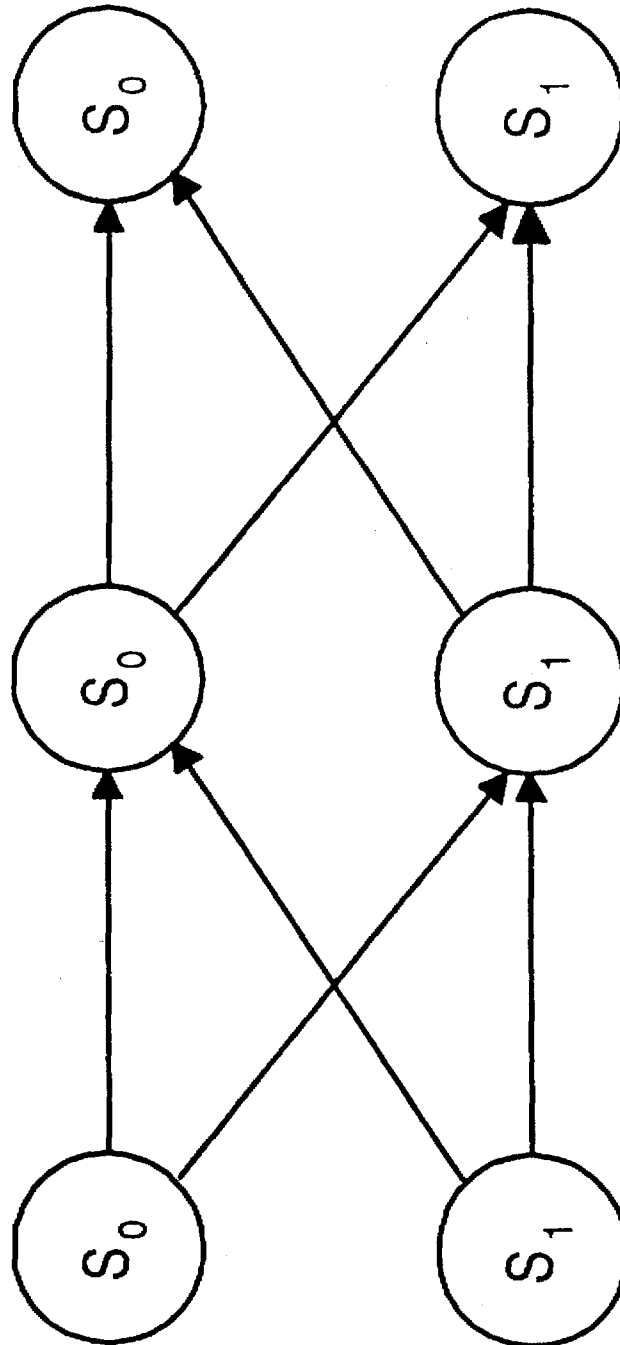
## [57] ABSTRACT

Encoding and decoding systems for data blocks based on forming corresponding code blocks having a maximum number of successive repetitions of a first symbol and a maximum number of successive repetitions of a second symbol, and having code blocks which can represent plural different ones of said data blocks unambiguously by having further code blocks aid in distinguishing data block is being represented.

19 Claims, 15 Drawing Sheets



*Fig. 1*



Group A		Group B		Group C		Group	
Binary	HEX	Binary	HEX	Binary	HEX	Binary	H
100001	21	100000	20	000001	01	000010	
100011	23	100010	22	010001	11	000100	
100101	25	100100	24	001001	09	000110	
101001	29	100110	26	011001	19	001000	
101011	2B	101000	28	000101	05	001010	
101101	2D	101010	2A	010101	15	001100	
110001	31	101100	2C	001101	0D	010000	
110011	33	110000	30	000011	03	010010	
110101	35	110010	32	010011	13	010100	
		110100	34	001011	0B	010110	
		110110	36	011011	1B	011000	
						011010	

FIG. 2

Data (HEX)	State 0 ( $S_0$ )		State 1 ( $S_1$ )	
	Codeword (HEX)	Next State	Codeword (HEX)	Next State
0000 (00)	100000 (20)	$S_0$	011000 (18)	$S_0$
00001 (01)	100010 (22)	$S_0$	000010 (02)	$S_0$
00010 (02)	100100 (24)	$S_0$	000100 (04)	$S_0$
00011 (03)	100110 (26)	$S_0$	000110 (06)	$S_0$
00100 (04)	101000 (28)	$S_0$	001000 (08)	$S_0$
00101 (05)	101010 (2A)	$S_0$	001010 (0A)	$S_0$
00110 (06)	101100 (2C)	$S_0$	001100 (0C)	$S_0$
00111 (07)	110110 (36)	$S_0$	010110 (16)	$S_0$
01000 (08)	110000 (30)	$S_0$	010000 (10)	$S_0$
01001 (09)	110010 (32)	$S_0$	010010 (12)	$S_0$
01010 (0A)	110100 (34)	$S_0$	010100 (14)	$S_0$
01011 (0B)	100001 (21)	$S_1$	010001 (11)	$S_1$
01100 (0C)	100011 (23)	$S_1$	010011 (13)	$S_1$
01101 (0D)	100101 (25)	$S_1$	010101 (15)	$S_1$

01110 (0E)	101001 (29)	S <sub>1</sub>	011001 (19)	S <sub>1</sub>
01111 (0F)	101011 (2B)	S <sub>1</sub>	011011 (1B)	S <sub>1</sub>
10000 (10)	100000 (20)	S <sub>1</sub>	011000 (18)	S <sub>1</sub>
10001 (11)	100010 (22)	S <sub>1</sub>	000010 (02)	S <sub>1</sub>
10010 (12)	100100 (24)	S <sub>1</sub>	000100 (04)	S <sub>1</sub>
10011 (13)	100110 (26)	S <sub>1</sub>	000110 (06)	S <sub>1</sub>
10100 (14)	101000 (28)	S <sub>1</sub>	001000 (08)	S <sub>1</sub>
10101 (15)	101010 (2A)	S <sub>1</sub>	001010 (0A)	S <sub>1</sub>
10110 (16)	101100 (2C)	S <sub>1</sub>	001100 (0C)	S <sub>1</sub>
10111 (17)	110110 (36)	S <sub>1</sub>	010110 (16)	S <sub>1</sub>
11000 (18)	110000 (30)	S <sub>1</sub>	010000 (10)	S <sub>1</sub>
11001 (19)	110010 (32)	S <sub>1</sub>	010010 (12)	S <sub>1</sub>
11010 (1A)	110100 (34)	S <sub>1</sub>	010100 (14)	S <sub>1</sub>
11011 (1B)	101101 (2D)	S <sub>1</sub>	001101 (0D)	S <sub>1</sub>
11100 (1C)	110011 (33)	S <sub>1</sub>	000011 (03)	S <sub>1</sub>
11101 (1D)	110101 (35)	S <sub>1</sub>	000101 (05)	S <sub>1</sub>
11110 (1E)	110001 (31)	S <sub>1</sub>	001001 (09)	S <sub>1</sub>
11111 (1F)	011010 (1A)	S <sub>1</sub>	001011 (0B)	S <sub>1</sub>

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