



- (51) International Patent Classification:
G11B 5/584 (2006.01)
- (21) International Application Number:
PCT/IB2013/060436
- (22) International Filing Date:
27 November 2013 (27.11.2013)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
1221556.2 30 November 2012 (30.11.2012) GB
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(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR,
KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,
SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: SERVO PATTERN OF A TAPE STORAGE MEDIUM

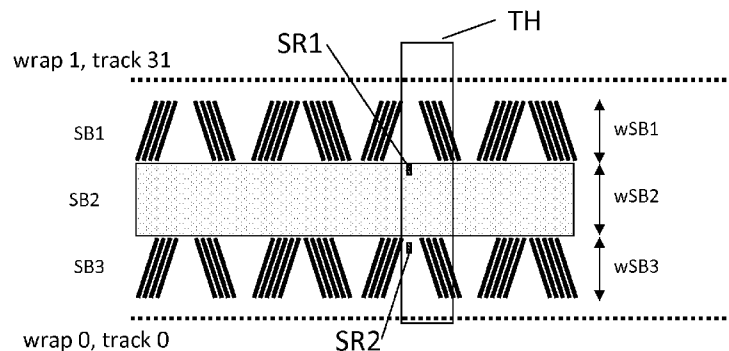


FIG. 10

(57) Abstract: A tape storage medium comprises at least one servo band (SB) along a longitudinal extension (x) of the tape storage medium (TP) for supporting to determine positional information. The servo band (SB) comprises a first servo subband (SB1) extending along the longitudinal extension (x) of the tape storage medium (1) and a second servo subband (SB2) extending along the longitudinal extension (x) of the tape storage medium (TP) next to the first servo subband (SB1). The first servo subband (SB1) comprises a frame servo pattern containing a set of servo frames (FR), wherein each servo frame (FR) of the set comprises a first burst (A) comprising at least two servo stripes (SP1) inclined at a first angle (α) with respect to a direction orthogonal to the longitudinal extension (x) of the tape medium (TP), followed by a second burst (B) comprising at least two servo stripes (SP2) inclined at a second angle (β) with respect to the direction orthogonal to the longitudinal extension (x) of the tape medium (TP), which second angle (α) is different from the first angle (β). The second servo subband (SB2) contains a set of servo tracks (STx) extending along the longitudinal extension (x) of the tape storage medium (TP) and arranged next to each other, wherein each servo track (STx) of the set contains a waveform pattern representing a waveform when being read, and wherein the waveforms of adjacent servo tracks (STx) are orthogonal to each other.



Published:

(88) Date of publication of the international search report:

24 July 2014

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

INTERNATIONAL SEARCH REPORT

International application No PCT/IB2013/060436
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A. CLASSIFICATION OF SUBJECT MATTER INV. G11B5/584 ADD.				
According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED				
Minimum documentation searched (classification system followed by classification symbols) G11B				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
Y	US 2007/047131 A1 (BERMAN DAVID [US] ET AL) 1 March 2007 (2007-03-01) paragraph [0072] - paragraph [0082] -----	1-15		
Y	US 2009/316296 A1 (CHERUBINI GIOVANNI [CH] ET AL) 24 December 2009 (2009-12-24) paragraph [0039] - paragraph [0041]; figure 4 -----	1-15		
A	US 2008/049356 A1 (WEBER MARK P [US] ET AL) 28 February 2008 (2008-02-28) the whole document figure 4 -----	1-15		
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
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Date of the actual completion of the international search	Date of mailing of the international search report			
20 May 2014	27/05/2014			
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Malagoli, M			

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2013/060436

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007047131 A1	01-03-2007	CN 1924999 A US 2007047131 A1	07-03-2007 01-03-2007
US 2009316296 A1	24-12-2009	EP 2301029 A2 KR 20110028453 A US 2009316296 A1 WO 2009153740 A2	30-03-2011 18-03-2011 24-12-2009 23-12-2009
US 2008049356 A1	28-02-2008	NONE	