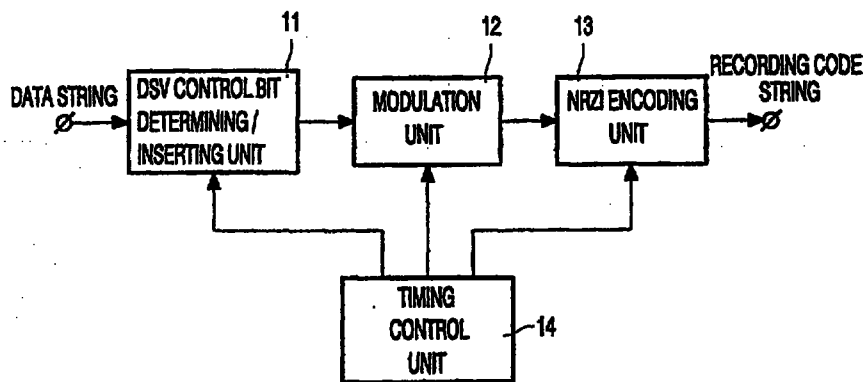




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(21) International Application Number: PCT/IB99/00948 (22) International Filing Date: 25 May 1999 (25.05.99) (30) Priority Data: 10/105280 29 May 1998 (29.05.98) JP (71) Applicants: KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL). SONY CORPORATION [JP/JP]; 6-7-35, Kitashinagawa, Kitashinagawa, Tokyo 141 (JP). (72) Inventors: SCHOUHAMER IMMINK, Kornelis, A.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). KAHLMAN, Joseph, A., H., M.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). VAN DEN ENDEN, Gijsbert, J.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). NAKAGAWA, T.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). SHIN-PUKU, Y.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). NAOHARA, T.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). NAKAMURA, K.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). (74) Agent: VAN DER KRUK, Willem, L.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>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.</i>

(54) Title: APPARATUS AND METHOD FOR MODULATION/DEMODULATION WITH CONSECUTIVE MINIMUM RUNLENGTH LIMITATION



MODULATION APPARATUS 1

(57) Abstract

Problem: how to record and play back data at a high line density. **Means for solving the problem:** a DSV control bit determining/inserting unit (11) inserts DSV control bits for execution of DSV control into an input data string and outputs the data string including the DSV control bits to a modulation unit (12). The modulation unit (12) converts the data string with a basic data length of 2 bits into variable length code with a basic code length of 3 bits in accordance with a conversion table and outputs the code resulting from the conversion to a NRZI encoding unit (13). The conversion table used by the modulation unit (12) includes substitution codes for limiting the number of consecutive appearances of a minimum run to a predetermined value and substitution codes for keeping a run length limit. In addition, the conversion table enforces a conversion rule, according to which the remainder of division of the "1" count of an element in a data string by 2 having a value of 0 or 1 shall always be equal to the remainder of division of the "1" count of an element in the code resulting from conversion of the data string by 2.