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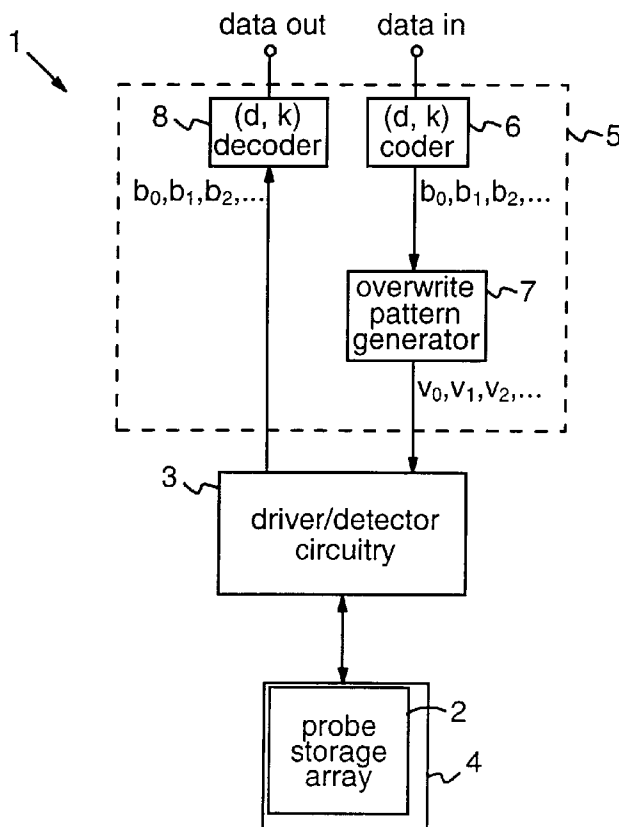
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- (71) Applicant (for all designated States except US): **INTERNATIONAL BUSINESS MACHINES CORPORATION** [US/US]; New Orchard Road, Armonk, NY 10504 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **ANTONAKOPOULOS, Theodore** [GR/GR]; 10 Souliou Str., GR-26224 Patras (GR). **ELEFThERIOU, Evangelos, S.** [GR/CH]; Bellariastrasse 53, CH-8038 Zurich (CH). **POZIDIS, Haris** [GR/CH]; Obstgartenstrasse 12, CH-8136 Gattikon (CH).
- (74) Agent: **TOLETI, Martin**; International Business Machines Corporation, Saeumerstrasse 4 / Postfach, CH-8803 Rueschlikon (CH).
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(54) Title: DATA OVERWRITING IN PROBE-BASED DATA STORAGE DEVICES



(57) Abstract: Methods and apparatus are provided for overwriting data in a probe-based data storage device (1) wherein data is represented by the presence and absence of pits formed in a storage surface (4) by a probe of the device. Input data is first coded such that successive bits of a given value x in the coded input data ($b_0, b_1, b_2, \dots$) are separated by at least d bits of the complementary value X , where d is a predetermined number $>, 2$. Overwrite data bits ($v_0, v_1, v_2, \dots$) are then generated by encoding the coded input data bits ($b_0, b_1, b_2, \dots$). In this encoding process, assuming a pit represents a bit of value p in the data storage device (1), then the following conditions are satisfied. Firstly, any bit of value x in the coded input data ($b_0, b_1, b_2, \dots$) is encoded as an overwrite data bit of value p . Second, any bounded run of L $2d$ bits of value x in the coded input data ($b_0, b_1, b_2, \dots$) is encoded as a run of L overwrite data bits of value p . Third, any bounded run of $L > 2d$ bits of value x in the coded input data ($b_0, b_1, b_2, \dots$) is encoded as a run of L overwrite data bits consisting of n bits of value p and $(L - n)$ bits of value p where $n = \text{CEILL}(L - 2d)/d$ and the n bits are positioned in the run such that: there is a bit of value p within d bits of the end of the run; there is a bit of value p within $2d + 1$ bits of the beginning of the run; and, for $n > 1$, each of the n bits is within d bits of another of the n bits. The overwrite data bits ($v_0, v_1, v_2, \dots$).

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