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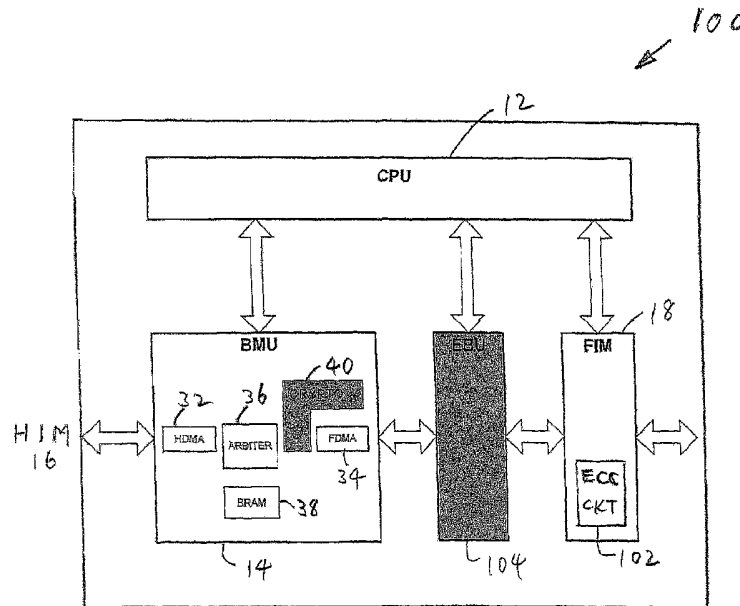
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(54) Title: MEMORY SYSTEM WITH IN STREAM DATA ENCRYPTION/DECRYPTION AND ERROR CORRECTION



(57) Abstract: The throughput of the memory system is improved where error correction of data in a data stream is cryptographically processed with minimal involvement of any controller. To perform error correction when data from the memory cells are read, the bit errors in the data in the data stream passing between the cells and the cryptographic circuit are corrected prior to any cryptographic process performed by the cryptographic circuit. Preferably the error correction occurs in one or more buffers employed to buffer the data between the cryptographic circuit and the memory where latency is reduced by using multiple buffers.

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B. FIELDS SEARCHED

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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 practical, search terms used)

EPO-Internal, PAJ, WPI Data, INSPEC, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 158 004 A (MASON ET AL) 5 December 2000 (2000-12-05)	1,2,5-7
Y		3,4,8,9
A	column 1, line 7 - line 11 column 1, line 43 - line 56 column 2, line 15 - line 23 column 3, line 63 - column 4, line 13 column 4, line 25 - column 5, line 26 figures 1,3,4	10
Y	US 5 438 575 A (BERTRAND ET AL) 1 August 1995 (1995-08-01) column 5, line 10 - line 36 column 6, line 52 - column 7, line 14 figures 1,5	3,4,8,9

Further documents are listed in the continuation of Box C.

See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 6158004	A	05-12-2000	DE	19803218 A1	17-12-1998
			JP	11003284 A	06-01-1999
US 5438575	A	01-08-1995	WO	9411800 A2	26-05-1994