

# Exhibit A



(12) **United States Patent**  
**Fallon**

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(54) **SYSTEM AND METHODS FOR ACCELERATED DATA STORAGE AND RETRIEVAL**

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“Operating System Platform Abstraction Method”, IBM Technical Disclosure Bulletin, Feb. 1995, vol. 38, Issue No. 2, pp. 343-344.

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(57) **ABSTRACT**

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Systems and methods for providing accelerated data storage and retrieval utilizing lossless and/or lossy data compression and decompression. A data storage accelerator includes one or a plurality of high speed data compression encoders that are configured to simultaneously or sequentially losslessly or lossy compress data at a rate equivalent to or faster than the transmission rate of an input data stream. The compressed data is subsequently stored in a target memory or other storage device whose input data storage bandwidth is lower than the original input data stream bandwidth. Similarly, a data retrieval accelerator includes one or a plurality of high speed data decompression decoders that are configured to simultaneously or sequentially losslessly or lossy decompress data at a rate equivalent to or faster than the input data stream from the target memory or storage device. The decompressed data is then output at rate data that is greater than the output rate from the target memory or data storage device. The data storage and retrieval accelerator method and system may be employed: in a disk storage adapter to reduce the time required to store and retrieve data from computer to disk; in conjunction with random access memory to reduce the time required to store and retrieve data from random access memory; in a display controller to reduce the time required to send display data to the display controller or processor; and/or in an input/output controller to reduce the time required to store, retrieve, or transmit data.

(65) **Prior Publication Data**

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**Related U.S. Application Data**

(63) Continuation of application No. 11/230,953, filed on Sep. 19, 2005, now abandoned, which is a continuation of application No. 10/628,801, filed on Jul. 28, 2003, now abandoned, which is a continuation of application No. 09/481,243, filed on Jan. 11, 2000, now Pat. No. 6,604,158, which is a continuation-in-part of application No. 09/266,394, filed on Mar. 11, 1999, now Pat. No. 6,601,104.

(51) **Int. Cl.**  
**G06F 15/173** (2006.01)

(52) **U.S. Cl.** ..... **709/231**

(58) **Field of Classification Search** ..... **709/231,**  
**709/233**

See application file for complete search history.

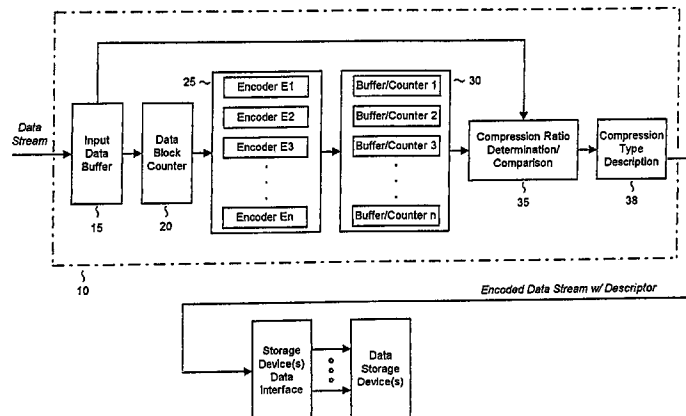
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**46 Claims, 20 Drawing Sheets**



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Page 2

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Page 4

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