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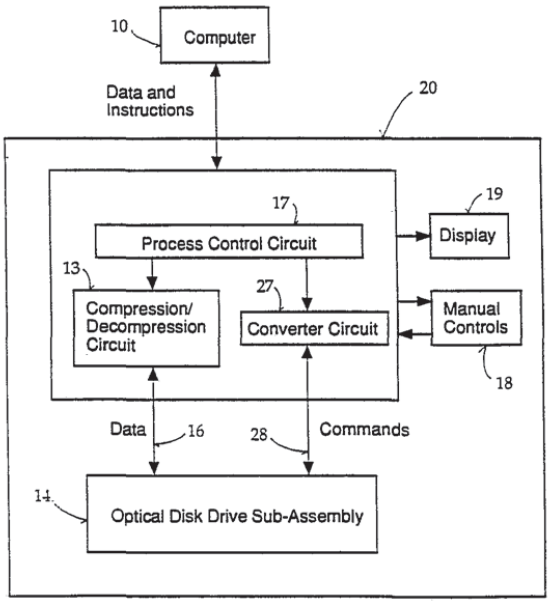
(54) Title: OPTICAL DISK DRIVE ASSEMBLY HAVING SELECTABLE COMPRESSION AND EMULATION

(57) Abstract

A system is disclosed for storing data on, and receiving data from, an optical disk. The data may be provided by a host computer. A compression/decompression circuit is included, and the data may be compressed or uncompressed in this circuit, at the option of a user, who can select from compression modes including a bypass mode and a target ratio mode. A converter circuit is included for translating from the host computer's commands to the optical disk drive's commands. The user may select a specific emulation for compatibility with other disk systems, and the user may select specific setup parameters for compatibility with a variety of host computers. Process control circuitry operates the compression and decompression circuit in one of a number of modes and emulations. The system may be enclosed in a full form factor size package. A display and manual controls, accessible to a user, are provided for user interface with the system. Many user options are provided to enhance compatibility with a wide variety of disk systems. The present invention provides a large storage capability for storing large amounts of information in less physical space. The system of the present invention is suitable for "plug and play" installation by computer manufacturers. As an additional advantage, the user can easily monitor data compression with the display that shows the compression ratio, continuously updated.



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OPTICAL DISK DRIVE ASSEMBLY HAVING SELECTABLE COMPRESSION AND EMULATION

BACKGROUND OF THE INVENTION

FIELD OF INVENTION

The present invention relates to optical disk drives for storage of digital information. More specifically, the present invention relates to a system including an optical disk drive and associated circuitry for data compression and conversion of commands, with a capability for selection of the compression mode, emulation of a number of pre-existing systems and selection of setup parameters. The system of the present invention may be enclosed in a housing with a size corresponding to the industry's 5.25" full height form factor standard, with manual controls for mode, emulation, and setup selection.

DESCRIPTION OF RELATED ART

The capability for storage of digital data has expanded dramatically over the past twenty years. Digital information was first stored on reels of magnetic recording tape; however, this storage method proved cumbersome, access to data was slow, and required many large reels of tape. The advent of the floppy disk ushered in a new era of speed and information density for digital

storage. Over the past few years, new products, such as the hard disk drive (often called the Winchester drive) have evolved, so that at present, storage capacities of 40 MB or more are common in hard disks internal to many personal computers, and access to much of the data is very quick.

Much greater storage capacities are possible in optical disks; for example, the Maxoptix® RXT-800HS, available from Maxoptix® Corporation of San Jose, CA, the assignee herein, can store 786 Megabytes of information on a write once optical disk. The Maxoptix® RXT-800HS drive is available in a half-height housing. Optical drives typically allow writing only once, and are often called "WORM" drives (for write-once, read-many). Erasable optical drives are also available.

An optical disk is inserted into the disk drive for writing or reading, and the disk can be removed for archival purposes. As a space saving media, optical disks are attractive for many uses, particularly when large amounts of data must be stored. Examples of optical disks include compact disks (CDs) used for digital music recording. Other uses for optical disks includes library storage of information such as images, databases, spreadsheets, desk-top publishing, CAD files, programs, binary data, and word processing. Optical disks are useful as backup storage media for computer networks having one or more disk drives. Massive storage capabilities are useful in medical processes that produce a large amount of digital data. For example, imaging processes, such as MRI (Magnetic Resonance

Imaging), output large quantities of data that must be stored quickly and efficiently. Later, when time is available , the data is processed to provide images useful for diagnosis and surgery.

As discussed, optical disks are useful for storage of large amounts of information. However, it would be an advantage to provide an even greater storage capability than that provided by the existing optical disk systems. To increase storage capacity of other non-optical digital recording formats such as hard disks, data compression circuitry has been used. For example, a data compression chip, the #9703 data compression co-processor, is available from Stac Electronics, of Carlsbad, California. However, data compression has not been used with optical disk drives in any meaningful way; one so-called data "compression" system for optical disk drives provides almost negligible storage reduction (0-5%) by using simple software driven routines. For example, if this system sees a string of blanks (zeros), it simply skips the data, effectively throwing it away. To significantly and meaningfully increase storage abilities, it would be an advantage to provide a compression system for an optical disk drive that can compress data two or more times. For example, with a 3:1 compression ratio, a 786 Megabyte drive can store 2.35 Gigabytes of information.

Another problem with data compression, as applied to optical disk systems, is the lack of compatibility between disks recorded without compression, and disks recorded with compression. Furthermore, whether or not disks are recorded

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