

**FILE MANAGEMENT APPARATUS
PERMITTING ACCESS TO PORTIONS OF A
FILE BY SPECIFYING A DATA STRUCTURE
IDENTIFIER AND DATA ELEMENTS**

This application is a continuation of application Ser. No. 08/320,974 filed Oct. 7, 1994 now abandoned which is a continuation of application Ser. No. 07/729,730 filed Jul. 15, 1991 now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to file management apparatus, and more particularly to a file management apparatus for storing files and making access to the stored files in response to an externally applied instruction, and an operating method thereof.

2. Description of the Background Art

In general, a file management apparatus is comprised of a disk storing a plurality of files therein and a disk driving apparatus for making access to the disk. In a conventional file management apparatus, a file reading and writing is executed in units of record in response to application of a read instruction and a write instruction from an information processing unit utilizing the file management apparatus.

In a system employing such a conventional file management apparatus, when data having a list structure is handled, for example, it is necessary to prepare a program for manipulation of a data structure such as addition, insertion and deletion of the list structure on the side of the information processing unit utilizing such a file management apparatus. In this case, data is read from the file management apparatus, the data structure manipulation is made for the read data, and the data is stored again in the disk of the file management apparatus. Further, when a plurality of information processing units share a single file management apparatus, each information processing unit requires a program for data structure manipulation. Thus, there is a disadvantage that efficiency in development of software decreases.

In addition, for development of a plurality of processing systems by utilizing a single file management apparatus, a function of data structure manipulation is required for the respective processing systems. In this case, when one processing system first manipulates the data structure of data in the file management apparatus and, then other processing systems manipulate the manipulated data structure of the data, the data structure manipulation in the other processing systems must be waited until the data structure manipulation in the one processing system is terminated. Thus, the program of the data structure manipulation in the one processing system and those in the other processing systems are dependent on one another. Accordingly, it entails difficulties to independently develop the plurality of processing systems.

SUMMARY OF THE INVENTION

One object of the present invention is to increase efficiency in software development.

Another object of the present invention is to provide a file management apparatus having a function of manipulating the structure of data, and an operating method thereof.

A further object of the present invention is to provide a file management apparatus for enabling parallel development of a plurality of processing systems.

A file management apparatus according to the present invention includes a storage portion for storing a plurality of data along with identifiers, and a manipulation portion responsive to an applied instruction for manipulating the structure of the data stored in the storage portion by using the identifiers.

The storage portion stores therein a plurality of data as one or a plurality of files including one or a plurality of data. The plurality of data each include one or a plurality of elements.

The identifiers include a file identifier for specifying each of the files and a data identifier for specifying each data. The identifiers may further include a position identifier for specifying the position of elements included in each data, an element number identifier for specifying the number of elements, and an element size identifier for specifying the size of each element.

A file management apparatus according to the present invention has a function of manipulating the structure of data by using the identifiers stored together with the data. Accordingly, data structure manipulation is carried out within the file management apparatus only by application of a predetermined instruction from an apparatus or processing system utilizing such a file management apparatus.

Consequently, it is unnecessary to prepare a program for data structure manipulation on the side of the apparatus or processing system utilizing the file management apparatus, and it also becomes unnecessary to be associated with an implementation method of data structure manipulation. Thus, efficiency in software development improves.

In addition, parallel development of a plurality of processing systems utilizing a file management apparatus is enabled, and independence of each processing system can be enhanced. It thus becomes possible to organize such a system that can flexibly cope with an enhancement in the function of each processing system.

A program developing apparatus according to another aspect of the present invention includes: a specification describing portion for preparing a graphic description of specifications with respect to an object program on a display screen; a converting portion for converting the specification description prepared by the specification describing portion into an executable program; and a file managing portion for storing therein as files, a plurality of data representing the specification description prepared by the specification describing portion and a plurality of data indicating the executable program converted by the converting portion. The file managing portion includes a storage portion for storing therein the plurality of data together with identifiers, and a manipulation portion responsive to an applied instruction for manipulating the structure of the data stored in the storage portion by using the identifiers.

The program development apparatus may include a parts managing portion including means for registering the specification description prepared by the specification describing portion as parts information, and means for presenting the registered parts information.

The foregoing and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram showing the configuration of a file management apparatus according to one embodiment of the present invention;