DESCRIPTION

DATA RECEIVING APPARATUS

Technical Field

The present invention relates to a data receiving apparatus which stores data, received via a communication network or the like, into a file.

Background Art

There is a conventional communication system which uses an information processing apparatus, such as a word processor or a personal computer, connected via a modem or the like to a telephone line or which has such information processing apparatuses serially connected together using RS-232C or the like. Such system stores data of a string of characters (hereinafter called "character string data") that has been received through communication in a file in an external storage section that is comprised of, for example, a floppy disk drive (FDD) in order to record the received data. In the case where an information processing apparatus is connected to a BBS (Bulletin Board System) to receive (or download) necessary information, all the data from the declaration of the beginning of reception till the declaration of the end of the reception is written in a file in an FDD or the like. That is, a text including menus and messages and control data as well as the necessary character string data which is to be received from the host side are written in a file.

As such an unnecessary text and control data or the like besides the necessary character string data are written in a file at the time of reception, the conventional data receiving apparatus needs a large file and thus suffers the ineffective use of the memory.

To receive only needed information to prevent the file size from increasing, it is necessary to finely instruct the declaration of the beginning of reception and the declaration of the end of the reception. Such an instruction is likely to result in an erroneous operation and involves a tiresome operation.

Disclosure of Invention

Accordingly, it is an object of the present invention to provide a data receiving apparatus capable of writing only necessary data in a file at the time of writing received data in the file.

To achieve the above object, according to the first aspect of this invention, there is provided a data receiving apparatus for receiving data via a communication network or the like and storing the data, which comprises:

storage means for storing start indicating information indicative of beginning of data;

detection means for detecting the start indicating information stored in the storage means from received data; and

data storage means for storing data among the

This Sheet Has Been Replaced



THIS SHEET HAS BEEN REPLACED

received data following the start indicating information detected by the detection means.

According to the second aspect of this invention, there is provided a data receiving apparatus for receiving data via a communication network or the like and storing the data, which comprises:

first storage means for storing start indicating information indicative of beginning of data;

first detection means for detecting the start indicating information stored in the first storage means from received data;

second storage means for storing end indicating information indicative of end of data;

second detection means for detecting the end indicating information stored in the second storage means from the received data;

data storage means for storing data; and

control means for storing received data following the start indicating information in the data storage means when the start indicating information is detected by the first detection means, and inhibiting data storage in the data storage means when the end instructing information is detected by the second detection means.

According to the first and second aspects of the present invention, only necessary data can be written in a file. Therefore, the size of the file may not be

This Sheet Has Been Replaced

THIS SHEET HAS BEEN REPLACED

increased. Further, the operation of the apparatus may be easy.

Brief Description of Drawings

FIG. 1 is a block structural diagram illustrating the essential portions of a personal computer according to one embodiment of this invention;

FIG. 2 is a diagram showing the memory structure of a RAM (Random Access Memory) used in this embodiment;

FIG. 3 is a diagram for explaining the contents of a download flag used in this embodiment;

FIG. 4 is a diagram exemplifying the data structure of character string data received via a communication network;

FIG. 5 is a flowchart for explaining a character string input process for storing a start character string and an end character string in a record file in the RAM; and

FIG. 6 is a flowchart for explaining a reception operation for receiving character string data.

Best Mode for Carrying Out the Invention

A preferred embodiment of the present invention will now be described specifically referring to the accompanying drawings.

FIGS. 1 through 6 are diagrams for explaining a data receiving apparatus according to one embodiment of this invention. In this embodiment, a communicatable

This Sheet Has Been Replaced

THIS SHEET HAS BEEN REPLACED

personal computer is connected to a communication network and stores only necessary information among character string data, received via this communication network, into a storage section.

To begin with, the structure of this embodiment will be discussed.

FIG. 1 is a block structural diagram illustrating the essential portions of a personal computer 1 according to this embodiment.

Referring to FIG. 1, the personal computer 1 comprises a CPU (Central Processing Unit) 2, an input section 3, an input control section 4, a ROM (Read Only Memory) 5, a RAM (Random Access Memory) 6, a display section 7, a display driving section 8, a printing section 9, a print control section 10, a storage device 11 and a communication control section 13, which are mutually connected by a bus 14.

The CPU 2 controls the individual components of the personal computer 1 in accordance with various control programs stored in the ROM 5. At the time downloaded data to be discussed later is stored in the RAM 6, the CPU 2 detects a start character string and an end character string, previously stored in the RAM 6, from the received character string data. The CPU 2 extracts a predetermined character string based on the detected start character string and end character string and stores only the extracted character string necessary

into a file (hereinafter, download-data record file). For instance, the CPU 2 performs such control that a character string following the start character string is stored in the download-data record file when it detects only the start character string, a character string up to the end character string is stored in the download-data record file when it detects only the end character string, or a character string lying between the start character string and the end character string is stored in the download-data record file when it detects only both the start character string and the end character string. Although a character string excluding the start character string and the end character string is stored in this embodiment, data reception may be so controlled as to store a character string including the start character string and the end character string.

The input section 3 has function keys for setting various functions, character data keys for inputting character data, ten keys for inputting numerical data, a download key for instructing the beginning of downloading and a file designation key for designating a file where a character string is to be stored. Signals associated with the operation of those various keys are output to the CPU 2 under the control of the input control section 4.

Stored in the ROM 5 are various kinds of control programs the CPU 2 executes and various kinds of data

which are to be processed at the time those control programs are executed.

The RAM 6 has a work area for temporarily storing data for data processing and various parameters, and a program area for storing a program. As shown in FIG. 2, for example, the RAM 6 has a reception buffer 6a for temporarily storing data received by the personal computer 1 via a communication network, and a first record file 6b, a second record file 6c, a third record file 6d and so forth where necessary data in the received data is downloaded. Each record file area consists of a record file name for recording the name of a file, a download-data record file for recording downloaded data, a start character string storage section for storing the start character string as a reference for the beginning of necessary downloaded data, an end character string storage section for storing the end character string as a reference for the end of necessary downloaded data, and a download flag section for storing a flag representing the download state of each record file.

The display section 7 displays text data, image data or the like, which have been received through the input section 3 or the communication control section 13 of the personal computer 1. The display section 7, comprised of a display like a CRT or LCD, is driven by the display driving section 8 designed for that display.

The printing section 9 sequentially prints out character data or the like which are developed in the RAM 6, for example, under the control of the print control section 10.

The storage device 11 has a storage medium 12 where programs, data, etc. have already been stored. This storage medium 12 is comprised of a magnetic storage medium, an optical storage medium or a semiconductor memory. The storage medium 12 may be provided in the storage device 11 permanently or may be a removable type. The programs, data and the like stored in the storage medium 12 may be received from another apparatus which is connected via a communication network. Alternatively, the storage device 11 equipped with the storage medium 12 may be provided in another apparatus which is connected via a communication network, so that programs, data and the like stored in this storage medium 12 can be used via the communication network.

The communication control section 13 is comprised of an I/O port, a modem or the like, which is connected to a communication network (analog public telephone network or digital public telephone network), and executes communication control for data such as an electronic mail which is transmitted and received through computer communication.

The bus 14 connects the aforementioned individual components to exchange control signals and data.

FIG. 3 is a diagram for explaining the contents of a download flag used in this embodiment. The download flag shows the state of a record file and which is to be written in the download flag section in each record file of the RAM 6 shown in FIG. 2.

As shown in FIG. 3, the download flag of "0" indicates that there is no downloading.

When the download flag is "1," downloading is in progress while the associated record file is closed.

When the download flag is "2," downloading is in progress and the associated record file is opened.

Although the download flag is defined as specified above in this embodiment, the states of the download flag are in no way limited to those types.

FIG. 4 is a diagram exemplifying the data structure of received character string data 21 received via a communication network (by an electronic mail in this example).

As shown in FIG. 4, control data 22 is located at the head of the received character string data 21, followed by a start character string 23 which indicates the beginning of an electronic mail, such as a character string "mail received." Then comes contents 24 of the mail as necessary character string data followed by an end character string 25 indicative of the end of the mail, such as a character string "want to delete?" Other character string data include a string of numerals

indicating a specific symbol or a specific control code, and a character string consisting of numerals and alphabets.

As apparent from the above, necessary character string data in the received character string data 21 is just the contents 24 of a mail which should be stored in a file at the time downloading is performed. In this embodiment, therefore, the start character string 23 and the end character string 25 are extracted from the received character string data 21 so that the contents 24 of a mail or the necessary character string data, located between the start character string 23 and the end character string 25, is selectively extracted and stored in a file.

The operation of this embodiment will be described below with reference to FIGS. 5 and 6.

FIG. 5 is a flowchart for explaining a character string input process for registering a start character string and an end character string in a record file in the RAM 6, and FIG. 6 is a flowchart for explaining a reception operation for receiving character string data. The programs which accomplish the functions described in the flowcharts in FIGS. 5 and 6 are stored in the storage medium 12 in the form of program codes which can be read by the CPU 2.

In the case where received character string data is downloaded into a predetermined record file in the RAM 6

in this embodiment, a process of inputting the start and end character strings is performed in advance in the set mode shown in FIG. 5.

First, the download flags in the record files 6b, 6c, 6d and so forth in the RAM 6 shown in FIG. 2 are all cleared (not shown). Of the record files 6b, 6c, 6d, etc., the one which is used to register the start and end character strings is designated (step S1). Then, the start character string is input (step S2) and the end character string is input (step S3) both using the input section 3.

Then, those entered start character string and end character string are set in association with the start character string storage section and the end character string storage section in the record file for download in the RAM 6 which has been designated in step S1 (step S4).

When the start and end character strings are set in this step S4, the download flag is set to "1" indicating that this record file is where downloaded data should be stored (step S5).

When the download flag in the record file is set to "1," if the received character string data contains the set start character string, character string data following the start character string can be automatically stored in the record file.

In the reception process at the time of data

downloading as shown in FIG. 6, first, it is determined in step S11 if one character has been received via the communication control section 12. When any single character has been received, the received character data is written in the reception buffer 6a in the RAM 6 (step S12). The writing of the received character data is repeated until the reception operation is completed (step S13).

When the reception operation is completed in step S13, the received character string data written in the reception buffer 6a is read out (step S14) and it is determined if the read character string data contains a reception end code (step S15). When the read character string data does not contain the reception end code, which means that complete character string data has not been received, the reception process for downloaded data is terminated.

When the read character string data contains the reception end code in step S15, which means that complete character string data has been received properly, the flow proceeds to step S16 to continue the reception process for downloaded data.

It is determined in step S16 whether the read character string data contains a file type code. If this file type code is present, the record file associated with that file type code is designated (step S17) after which the flow goes to step S19.

If no file type code is present in the read character string data in step S16, no record file is designated by the type code so that the flow proceeds to step S18 to wait for a user's designation of a record file. When no user's designation is made, the process is terminated there, whereas when user's designation is made, the flow moves to step S19.

In step S19, it is determined if the download flag in the designated file is "0." When the download flag is "0," no downloading is to be performed as apparent from FIG. 3 so that the process is terminated. When the download flag in the designated file is other than "0" (either "1" or "2"), the flow proceeds to step S20 where it is determined if the download flag is "1." When the download flag is "1," the file is closed although downloading is in progress, so that it is determined in step S21 if the read character string data contains the start character string.

When the start character string is detected, the download flag in the designated file is set to "2" (step S22) to open the file and the next character string data stored in the reception buffer 6a is read out (step S23). When the read character string data does not contain the start character string in step S21, the flow immediately proceeds to step S23 without executing step S22 to read out the next character string data from the reception buffer 6a.

Then, the next character string data in the reception buffer 6a is read out in step S23 after which it is determined if the read character string data is the end character string in step S24. When it is not determined that the read character string data is the end character string, the flow goes to step S25 to write the contents of the character string currently read from the reception buffer 6a into the designated file (the download-data record file in the predetermined record file in the RAM 6), and then the next character string data is read from the reception buffer 6a in step S23. The data writing into the designated file is repeated until the end character string is detected (steps S23 to S25).

When it is determined in step S24 that the read character string is the end character string, the writing of the character string data is to be stopped, so that the designated file is closed (step S26) and the download flag in the designated file is set to "1" (step S27).

In the data receiving apparatus according to this embodiment, as described above, the start character string and the end character string have previously been registered to restrict the range of data to be downloaded, making it possible to write only necessary character string data in the received data into the desired record file. This feature eliminates the need

for post edition after downloading and can prevent a careless erroneous operation which may otherwise be caused by such post edition.

Because only necessary character string data is downloaded, a small record file is sufficient for registering this character string data, thus contributing to cost reduction.

Since a plurality of record files are provided in the RAM 6 and character strings associated with those record files can be registered individually in this embodiment; character strings can be recorded in the respective files purpose by purpose. Therefore, it is possible to automatically arrange the transmitted contents to write only necessary data in the associated record files. That is, the record files can be used distinctly in accordance with the types of data; for example, an electronic mail may be recorded in the first record file while bulletin board data is recorded in the second record file. Alternatively, files for electronic mails may be prepared sender by sender.

Although only one embodiment of the present invention has specifically been described herein, it should be apparent to those skilled in the art that this invention may be embodied in many other specific forms without departing from the spirit or scope of the invention.

For example, although character string data is

written in a file clause by clause, such writing may be carried out character by character or line by line.

Although the start character string and end character string are registered at the time reception (download) is declared in the above-described embodiment, the registration of such character strings may be performed with respect to a predetermined character string.

Although reception (download) is declared at the time reception (download) takes place in this embodiment, this declaration is not essential. It may be defined in such a way that when a certain registered character string is detected, character string data is automatically written in the associated record file.

The foregoing description of this embodiment has been given with reference to the case where transmitted character string data is written in a file. This invention is also adaptable to the case where character string data is transferred from one file to another.

This Sheet Has Been Replaced

C L A I M S

1. A data receiving apparatus for receiving data via a communication network or the like and storing said data, comprising:

storage means (6) for storing start indicating information indicative of beginning of data;

detection means (2) for detecting said start indicating information stored in said storage means from received data; and

data storage means (6) for storing data, among said received data, following said start indicating information detected by said detection means (2).

2. The data receiving apparatus according to claim 1, further comprising received data storage means (6) for temporarily storing received data in predetermined units, whereby detection of said start indicating information is performed for each predetermined unit based on said received data stored in said received data storage means (6), and when said start indicating information is detected, subsequent received data is stored in said data storage means (6).

3. A data receiving apparatus for receiving data via a communication network or the like and storing said data, comprising:

first storage means (6) for storing start indicating information indicative of beginning of data;

first detection means (2) for detecting said start

* C L M S *

THIS SHEET HAS BEEN REPLACED

This Sheet Has Been Replaced

indicating information stored in said first storage means (6) from received data;

second storage means (6) for storing end indicating information indicative of end of data;

second detection means (2) for detecting said end indicating information stored in said second storage means (6) from said received data;

data storage means (6) for storing data; and

control means (2) for storing received data following said start indicating information in said data storage means (6) when said start indicating information is detected by said first detection means (2), and inhibiting data storage in said data storage means (6) when said end instructing information is detected by said second detection means (2).

4. A storage medium storing program codes readable by a computer, storing:

a program code for permitting start indicating information indicative of beginning of data to be stored;

a program code for permitting data to be received;

a program code for permitting said stored start indicating information to be detected from said received data; and

a program code for permitting data, among said received data, following said detected start indicating information to be stored.

* C L M S *

THIS SHEET HAS BEEN REPLACED

This Sheet Has Been Replaced

5. A storage medium storing program codes readable by a computer, storing:

a program code for permitting start indicating information indicative of beginning of data to be stored;

a program code for permitting data to be received;

a program code for permitting said stored start indicating information to be detected from said received data;

a program code for permitting end indicating information indicative of end of data to be stored;

a program code for permitting said stored end indicating information to be detected from said received data; and

a program code for permitting received data following said start indicating information to be stored when said start indicating information is detected, and inhibiting storage of data to be received when said end instructing information is detected.

* C L M S *

THIS SHEET HAS BEEN REPLACED