

US00RE40547E

(19) **United States**  
(12) **Reissued Patent**  
**Akiyama et al.**

(10) **Patent Number:** **US RE40,547 E**  
(45) **Date of Reissued Patent:** **Oct. 21, 2008**

(54) **SOFTWARE REPRODUCTION APPARATUS**

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(21) Appl. No.: **09/654,929**

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(22) Filed: **Sep. 5, 2000**

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Reissue of:

(64) Patent No.: **5,812,661**  
Issued: **Sep. 22, 1998**  
Appl. No.: **08/510,122**  
Filed: **Aug. 1, 1995**

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(30) **Foreign Application Priority Data**

Aug. 10, 1994 (JP) ..... 6-219364

(Continued)

(51) **Int. Cl.**  
**H04K 1/00** (2006.01)

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(52) **U.S. Cl.** ..... **705/52**

(58) **Field of Classification Search** ..... **705/50,**  
**705/51, 52, 32**

(57) **ABSTRACT**

See application file for complete search history.

This invention provides an input switchover means for switching input routes according to the type of medium or communications, a software management means for decoding encrypted software information and for managing monetary charges according to the usage amounts of this software, an information conversion section for converting decoded data outputted from the previously mentioned software management means to visible or audible data, and an output route switchover means for outputting to the previously mentioned software management means encrypted software data, and for outputting to the previously mentioned information conversion section non-encrypted software information.

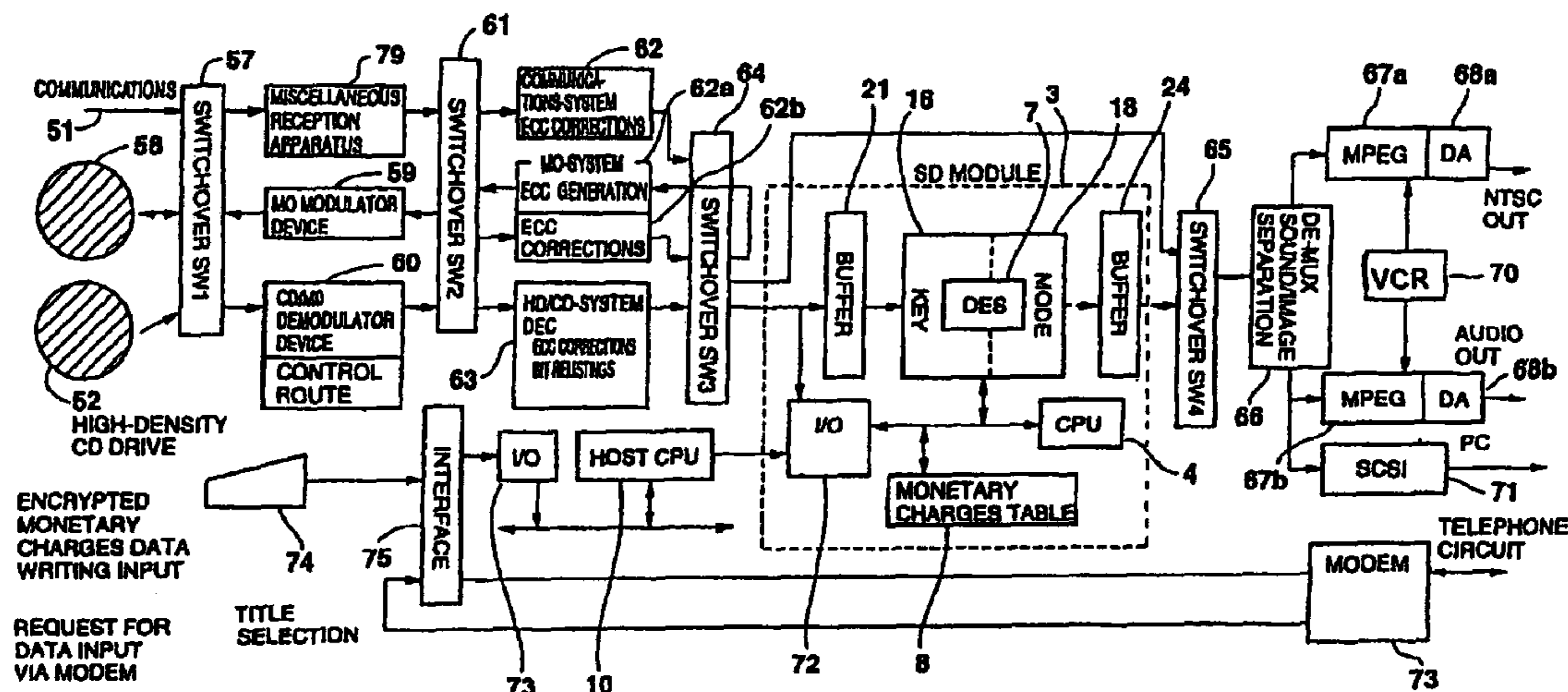
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**41 Claims, 7 Drawing Sheets**

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FIG. 1

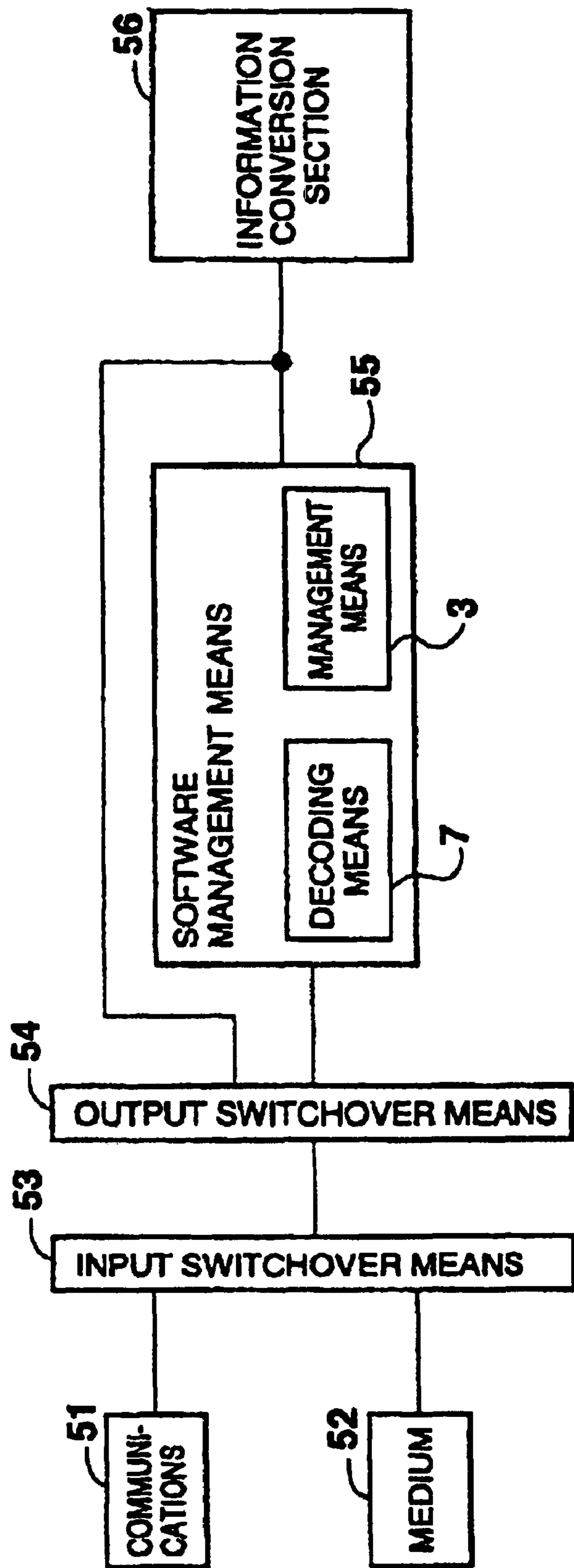
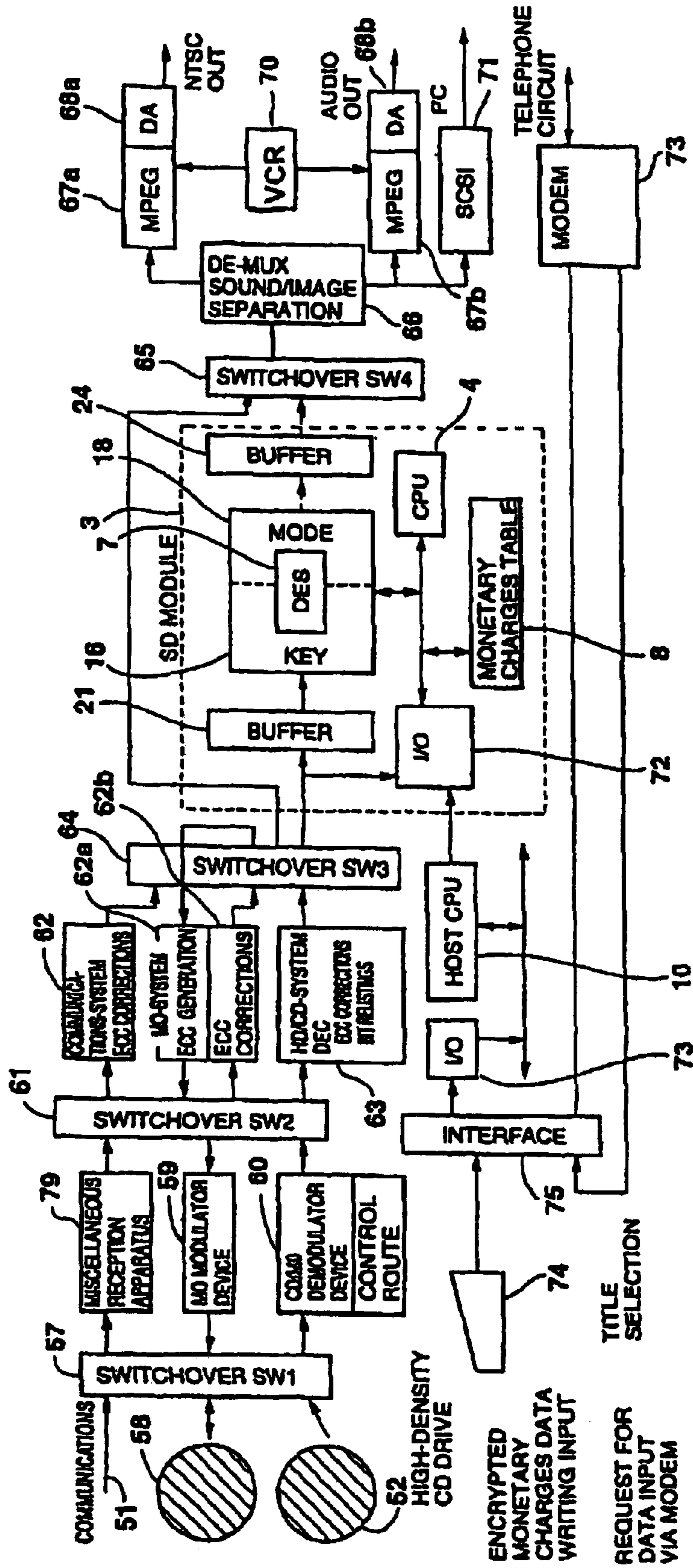
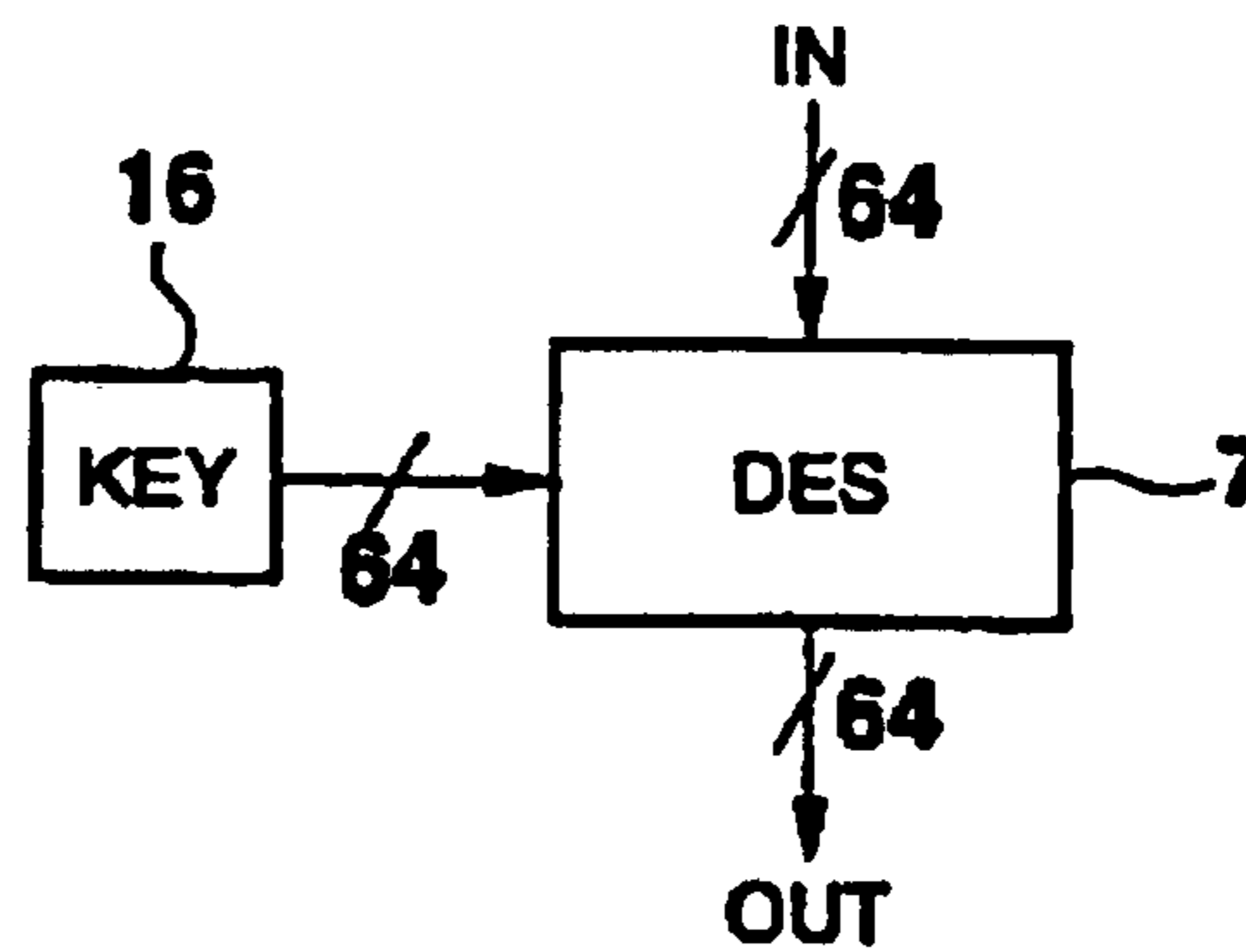


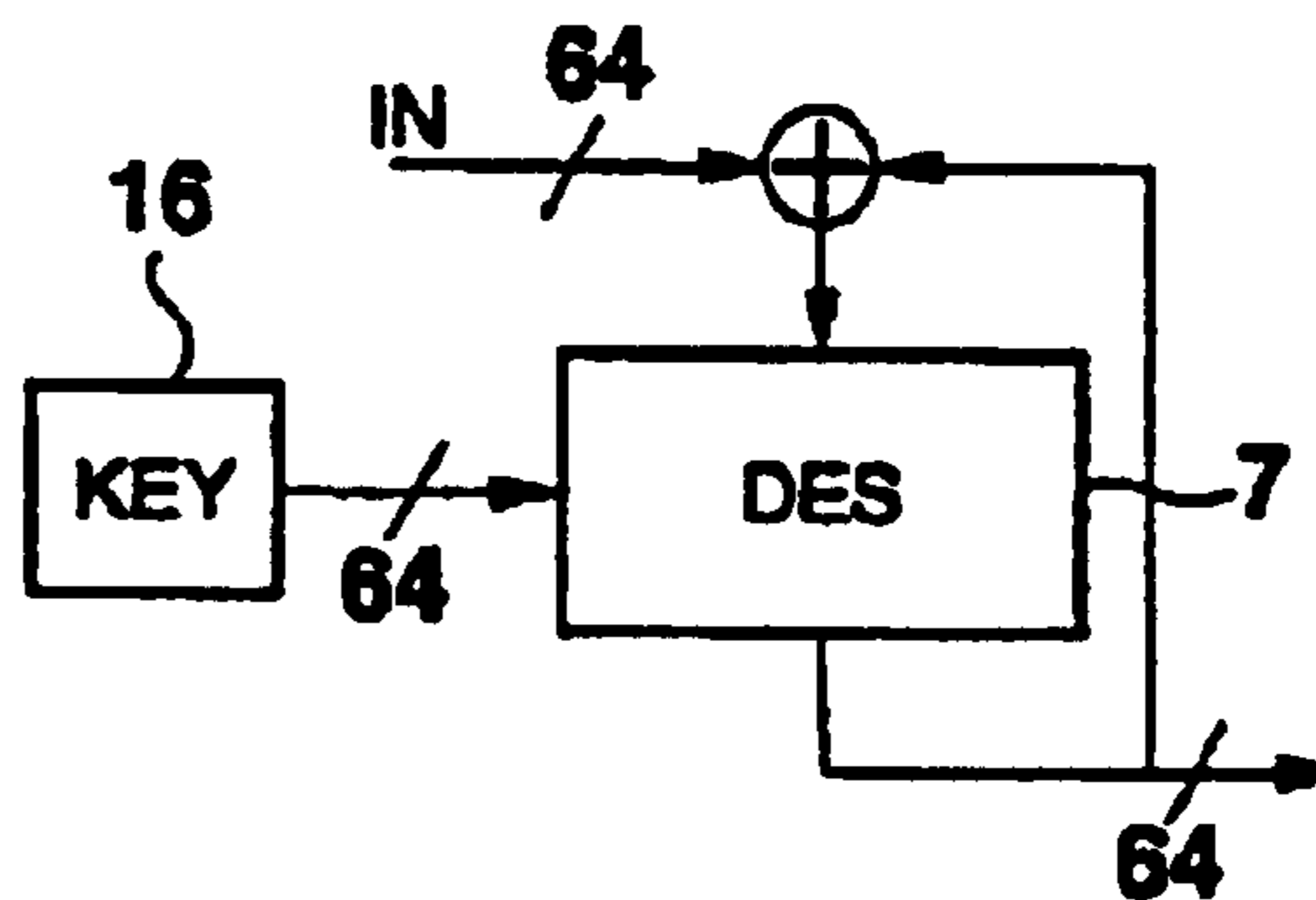
FIG. 2  
(AMENDED)



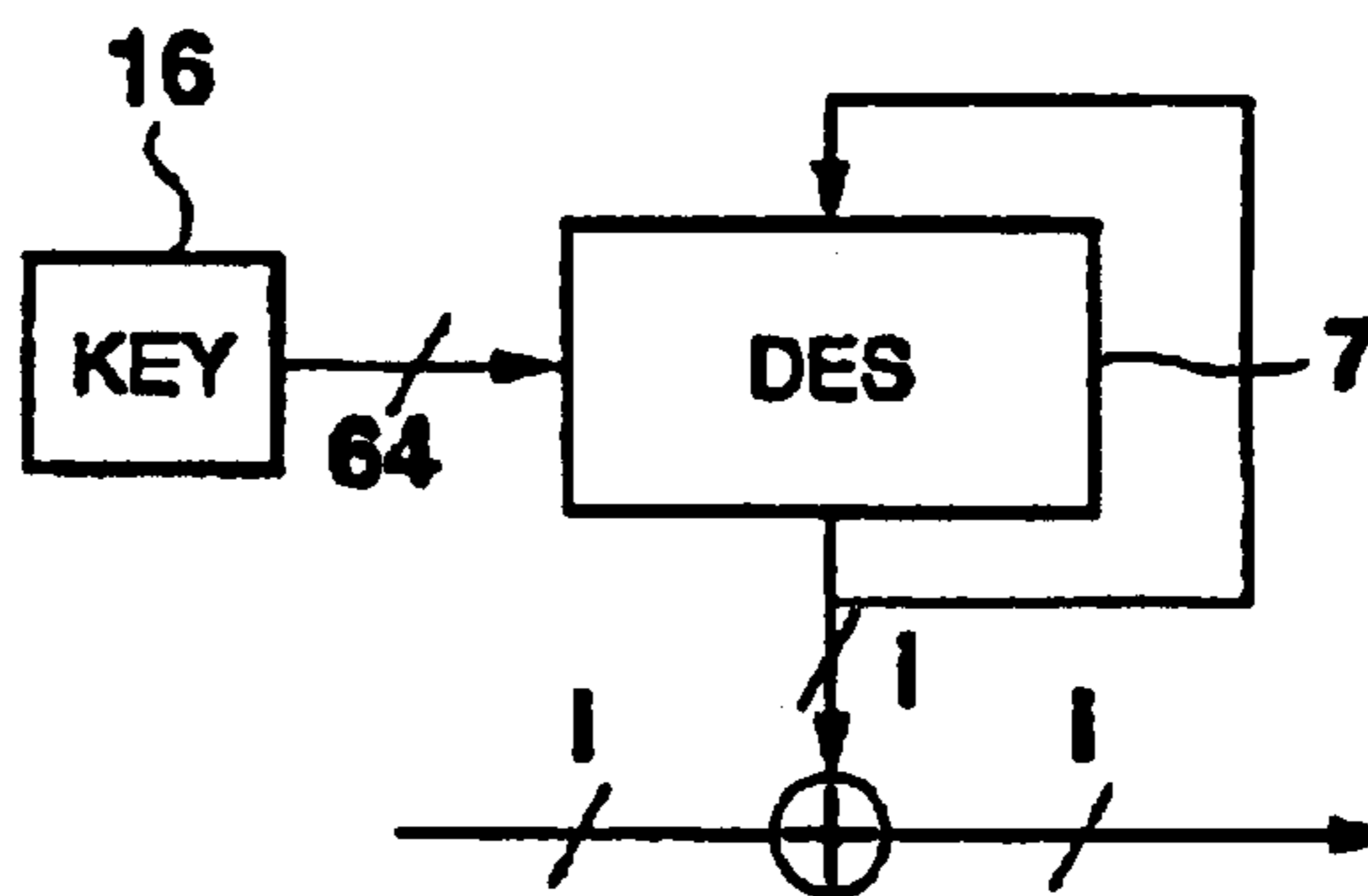
**FIG. 3 A**



**FIG. 3 B**



**FIG. 3 C**



**FIG. 3 D**

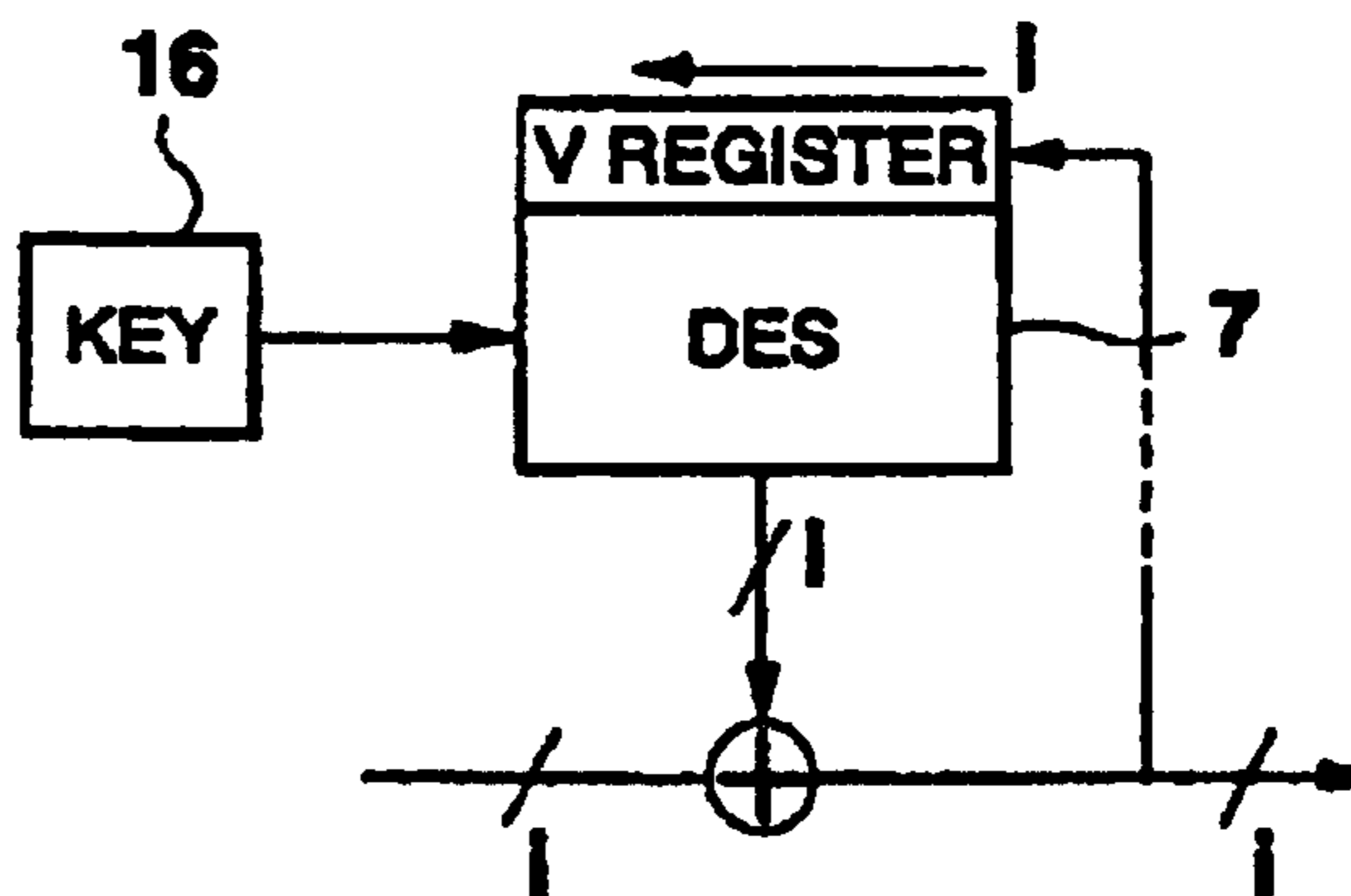


FIG. 4

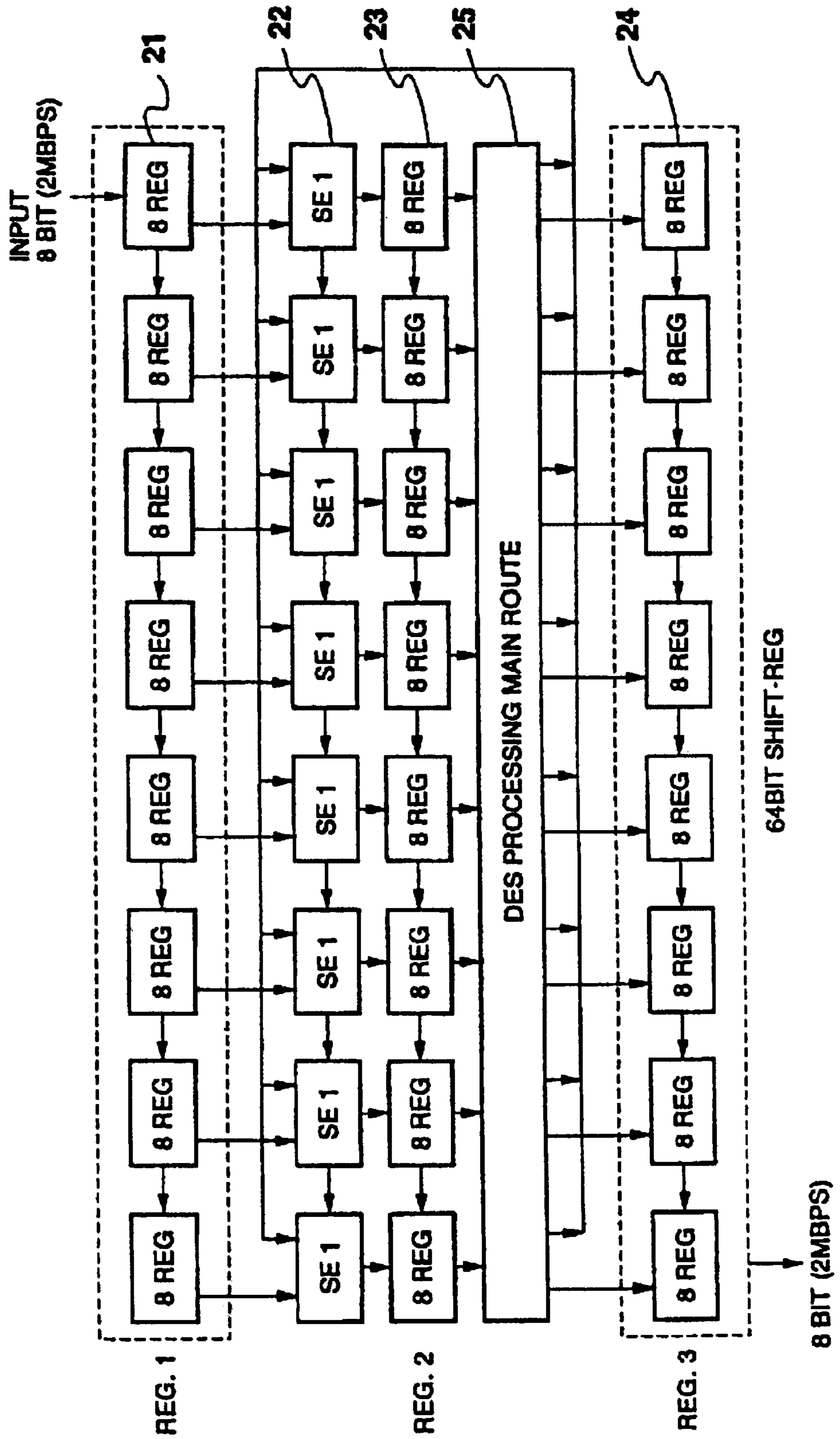


FIG. 5

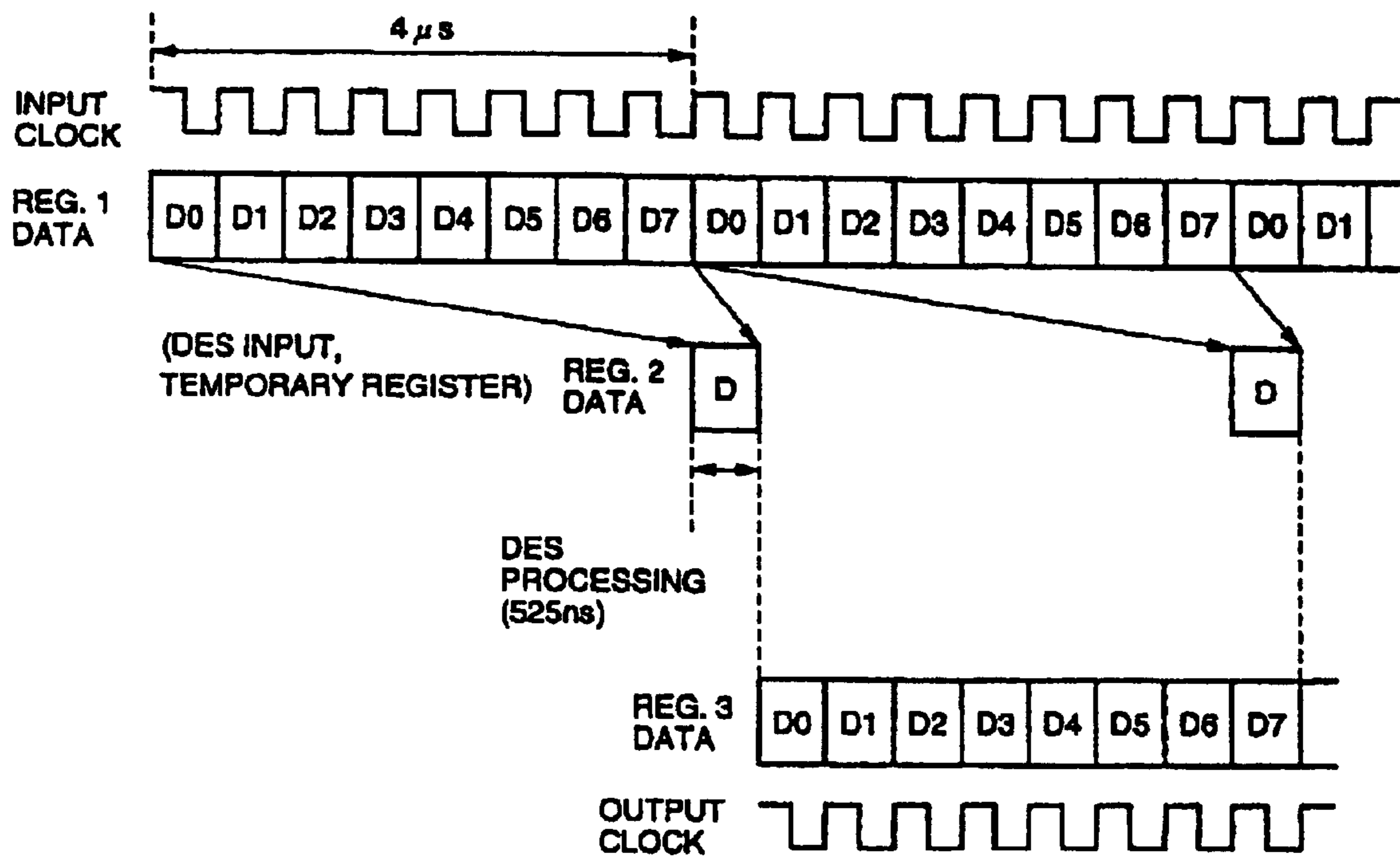


FIG. 6

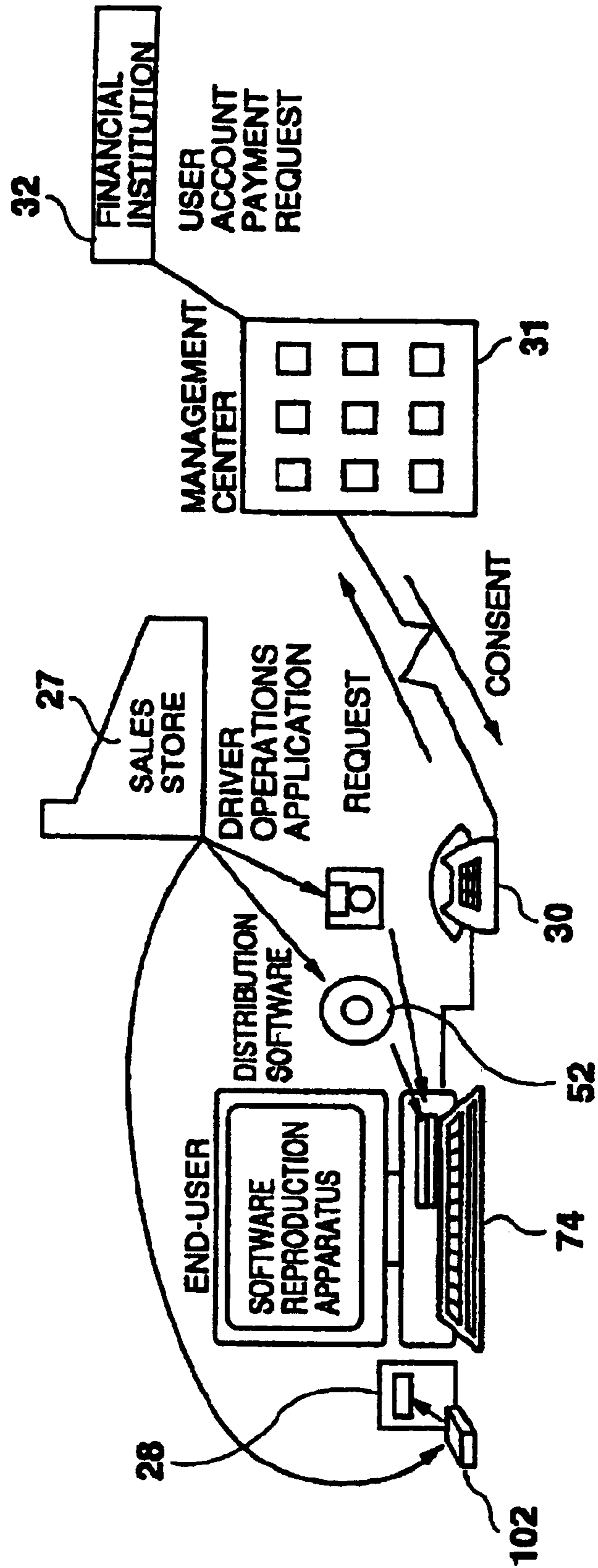
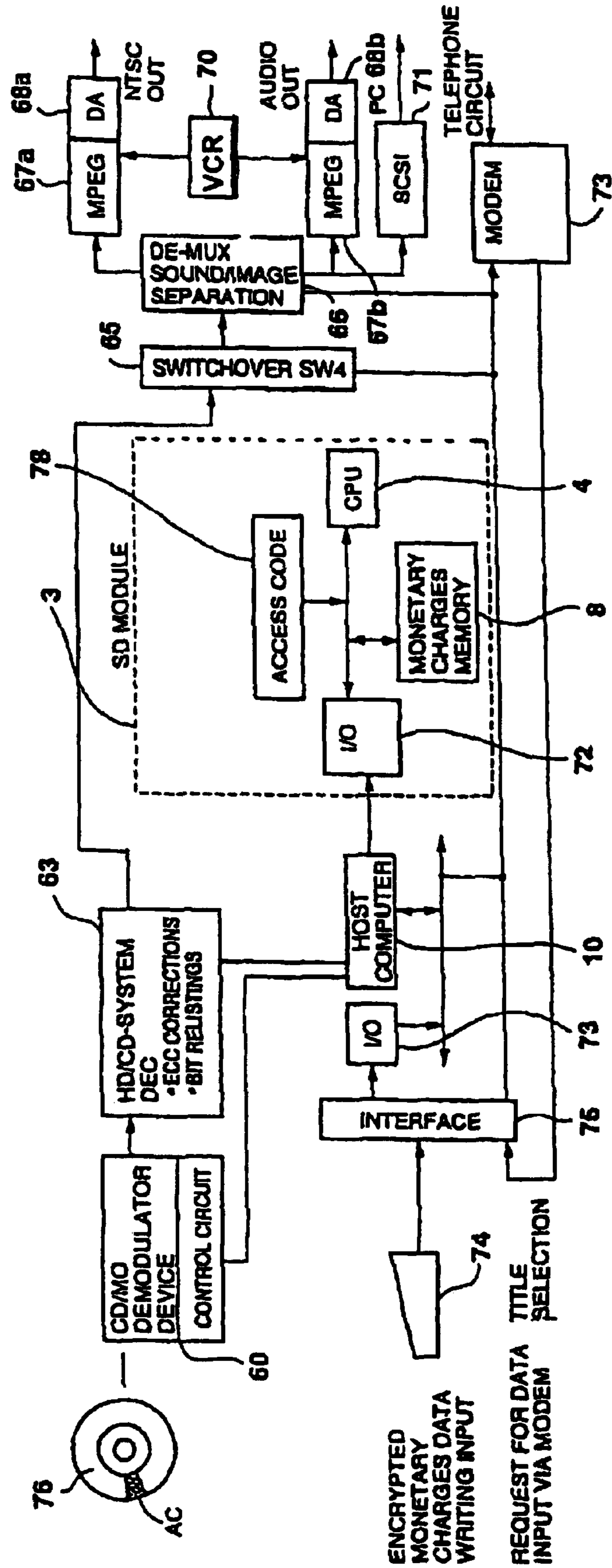




FIG. 7  
( AMENDED )



## SOFTWARE REPRODUCTION APPARATUS

**Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.**

## BACKGROUND OF THE INVENTION

The present invention relates to a software reproduction apparatus.

The present invention relates to an effective technology applicable for distribution systems for computer programs or software such as copyrighted image materials, etc., especially digitized information software.

As large-scale memory media such as CD-ROM, MO etc., and large-volume, high-speed communications technologies such as B-ISDN, etc., are further developed, it is expected that not only, of course, computer programs that use these means, but also image and sound, will be distributed as digital data.

In other words, copyrighted image analog data that have been supplied in the past in such forms as video tapes are now being stored as digital data in CD-ROM and sold, or such materials are beginning to be distributed within the market as game software through utilizing the interactive (bidirectional) nature of CD-ROM.

Also, the same situation is occurring with communications circuits: such data as the previously mentioned copyrighted image data are now beginning to be placed in the hands of users via communications.

Incidentally, it is extremely easy to copy this type of digital data onto other media. Moreover, since there is no worry that deterioration will occur through the copying of digital information as occurs when analog information is copied, it is possible to duplicate digital information, and there is an extremely high possibility that these types of acts of copying will impair the profits of manufacturers. In other words, it is easy to copy the contents of a CD-ROM with only a rudimentary knowledge of DOS commands, so long as the would-be copier possesses an optical magnetic disk or an optical magnetic disk apparatus, etc., that is capable of large-volume rewrites.

In this way, for the reason that a sufficient security check is impossible, acts of renting these types of digital data media have, in most cases, been prohibited by manufacturers.

However, currently end-users often hesitate to purchase this type of software because the price is too high, or because they don't know if the software will truly match their desired software, or they wait to ascertain whether or not the software is usable on the hardware that they now possess.

In regards to this point, a new software offering system is beginning to be realized wherein multiple software with limited functions are stored on a CD-ROM and sold for a low price, and whereby the end-use pays a fee for desired software on the CD-ROM, and is thereby notified of a code that will remove the functional limitations.

However, the software offering method noted above cannot be said to have sufficiently reflected the special characteristics of the software.

In other words, for the previously mentioned removal of functional limitations, the fee payment in most cases consists of a one-time only, lump-sum payment, and this fee inevitably consists of a high amount. Thus, for example, in those cases where a user only wants to view for a short

period a single scene of an image, or when a user wants to use a spreadsheet for only a week, it is difficult to manage fees according to the usage amounts.

In regards to this point, a method was proposed in the Laid-Open Patent No. 19707/1996 whereby the usable price amount was registered beforehand on an IC card, and, in the case where billable software is used, the usable price amount on the IC card is registered within the system, and every time an applicable item of software is used, the system deducts the amount from the balance.

Also, a method was proposed by the present applicants in the Laid-Open Patent No. 9687/1995 whereby a rewriteable domain is provided within the memory medium of the CD-ROM, etc., and whereby usage-time data is managed.

## SUMMARY OF THE INVENTION

The present invention provides an input switchover means for switching input routes according to the type of data offering format (for example, communications or a medium) provided to the user, a software management means for decoding encrypted software data and for managing monetary charges according to the amount of the software data used, a data conversion section for converting decoded data output from the previously mentioned software management means to output data for presenting to the user, and an output route switchover means for outputting encrypted software data to the previously mentioned software management means, and for outputting non-encrypted software data to the previously mentioned data conversion section.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a theoretical diagram of the present invention.

FIG. 2 is a block diagram showing the configuration of the software reproduction apparatus that is a preferred embodiment of the present invention.

FIGS. 3A-FIG. 3D are explanatory diagrams showing the DES mode of the preferred embodiment.

FIG. 4 is a block diagram showing a detailed configuration of the DES of the preferred embodiment.

FIG. 5 is a chart diagram showing the timing of DES input and output of the preferred embodiment.

FIG. 6 is a conceptual diagram showing an overall image of software usage of the present invention.

FIG. 7 is a main block diagram showing the configuration of the software reproduction apparatus that is a variation of the preferred embodiment.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention, as shown in the conceptual diagram that is FIG. 1, basically provides an input switchover means (53) that switches the input route according to the type of data offering format (here, communications (51) or a medium (52)) provided to the user, a software management means (55) for decoding encrypted software data and for managing monetary charges according to the amount of the software data used, a data conversion section (56) for converting decoded data output from the previously mentioned software management means (55) to output data for presenting to the user, and an output route switchover means (54) for outputting encrypted software data to the previously mentioned software management means (55), and for outputting non-encrypted software data to the previously mentioned data conversion section (56).

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Software data is, for example, program, sound, animation, or still image, etc., data, and this software data may be obtained from the route of public-circuit, dedicated communications-circuit, etc., wired/wireless communications (51), or it may be obtained by the method of a CD-ROM, an optical magnetic disk, a portable magnetic disk, etc., medium (52).

Software data provided to the user through these means consists of encrypted data and non-encrypted data; encrypted software data is managed by the monetary charges system to be discussed below according to the usage amount (reproduction amount) of that software data.

The software management means (55) is comprised of, for example, a decoding means (7) called a "DES" (Data Encryption Standard) equipped with various blocks for decoding the previously mentioned software data, and through key data granted from the management center that is not shown in FIG. 1, encrypted data is deciphered into ordinary text. Also, the software management means (55) is equipped with a management means (3) for managing usage amounts of this type of encrypted software data. This management means is equipped internally with a monetary charges information memory means that includes monetary tables, etc., and is made to execute monetary charges according to software usage amounts (reproduction amounts).

The data conversion section (56) is, for example, a section for performing expansions of compressed image data, and for controlling the synchronism of image data and sound data, and this data conversion section (56) is connected to an external speaker, a TV monitor, etc.

Within the present invention, the output switchover means (54) is made to, when the software data is encrypted, output that data to the software management means (55), and when the software is not encrypted, to directly output that data to the data conversion section (56). Therefore, with the present invention, both encrypted software and non-encrypted software is uniformly manipulatable.

Next, a specific preferred embodiment will be explained.

FIG. 2 is a functional block diagram that shows the internal configuration of the software reproduction apparatus 105 that is a preferred embodiment of the present invention.

In the diagram, the switchover switch 57 (SW1) may also function as the input interface, and inputs software data from various offering routes, including the communications circuit 51, the CD-ROM 52, etc. Also, within this switchover switch 57 (SW1), it is also possible to rewrite software data through an optical magnetic disk drive apparatus not shown in the diagram to the optical magnetic disk 58. In other words, the switchover switch 57, although abbreviated in the diagram, is comprised of a miscellaneous reception apparatus and an interface circuit for generating interrupt signals when individual signals are received at separate input terminals, and is operated through the control of the host CPU 10.

Placed on the next level after the switchover switch 57 (SW1) are, as the signal processing means, the reception apparatus 58, the MO modulator device 59, and the CD/MO demodulator device 60. The reception apparatus 58 is an apparatus for converting software data provided as reception signals from the communications circuit 51 into a data format that can be manipulated within the present apparatus; the MO modulator device 59 is a modulation means for performing writing to the optical magnetic disk 58. Also, the CD/MO demodulator device 60 is a device for demodulating read data from the optical magnetic disk 58 or the CD-ROM 52, and demodulation control is accomplished through the control route.

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The switchover switch 61 (SW2) is a switch for outputting selectively to each type of error processing means data outputted from the miscellaneous signal processing means explained previously. Also, in the case where writing to the optical magnetic disk 58 is performed, the switchover switch 61 (SW2) controls the transfer of inverse direction data from the error processing means to the signal processing means.

This switchover switch 61 (SW2), although abbreviated in the diagram, is comprised of a miscellaneous reception apparatus and an interface circuit for generating interrupt signals when individual signals are received at separate input terminals, and is operated through the control of the host CPU 10.

The error processing means is divided into the communications-system error processing section 62, the optical magnetic disk-system error processing section 62 [sic] (62a, 62b), and the magnetic disk/CD-system error processing section 63.

The optical magnetic disk-system error processing section 62 is comprised of an error check code generation section 62a for performing error check processing of data when such data is written to the optical magnetic disk, and an error check code correction section 62b for performing error checks when data is read from the optical magnetic disk.

Furthermore, the magnetic disk/CD-system error processing section 63 can also perform processing such as bit relisting, etc., together with error check code corrections.

In this way, with the present preferred embodiment, error processing corresponding to each offering format is enabled, and only data that has completely undergone error processing is subject to decoding processing and monetary charges processing, both to be discussed below.

Located at the last step of the previously mentioned error processing means is the switchover switch 64 (SW3). This switchover switch 64 (SW3) has the function of controlling routes, either by outputting to the software management section 3 of the next step the software data processed with the previously mentioned signal processing means and the error processing means, or by outputting this data to the switchover switch 65 (SW4) to be discussed below; or it may take output from the previously mentioned error check code correction section 62b and return it to the error check code generation section 62a.

#### Writing from a CD-ROM to an Optical Magnetic Disk

Here, the sequence of controlling the switchover switch 64 (SW3), and of writing encrypted software data read from the CD-ROM 52 to the optical magnetic disk 58 will be simply explained.

First, data read from the CD-ROM 52 through route switching by the switchover switch 57 (SW1) operated by the host CPU 10 is inputted to the CD/MO demodulator device 60. Data that is demodulated here is sent to the magnetic disk/CD-system error processing section 63 through a route switchover by the switchover switch 61 (SW2). Data that has undergone error check code correction and bit relisting here has added to it an error check code corresponding to the optical magnetic disk sent to the error check code generation section 62a through a route switchover by the switchover switch 64 (SW3). Then, this data, through a route switchover by the switchover switch 61 (SW2), is sent to the MO modulator device 59, where it is transformed into a data format that can be written onto the optical magnetic disk 58, and, through the switchover switch 57 (SW1), the data is then written onto the optical magnetic disk 58.

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In this way, data written onto the optical magnetic disk **58** is sent from the switchover switch **57** (SW1) via the CD/MO demodulator device **60**, the switchover switch **61** (SW2), the optical magnetic disk error processing section **62a** [sic], and the switchover switch **64** (SW3), and is inputted to the software management section **3**; data that has been decoded here is inputted via the switchover switch **65** (SW4) to the sound-image separation section **66** (DE-MUX), and is output through MPEG **67a**, MPEG **67b**, etc., externally as image data or sound data. Here, MPEG processing is performed in conformance with "ISO/IEC CD13818' 1-3".

#### The Configuration of the Software Management Section

The software management section **3** is realized with module architecture, for example, with an IC card (for example, a card format that conforms to PCMCIA), a board, etc., and is chiefly comprised of a DES (Fip's Publication Co.'s 460DATA ENCRYPTION STANDARD NIST) as the decoding section **7** that possesses the input buffer **21** and the output buffer **24**.

The previously mentioned DES is made to receive the key data **16** from an external source, and, based on this key data, the DES functions and is made to decode encrypted data. Furthermore, within the present preferred embodiment, the DES possesses a mode identification section **18** (MODE), and this mode identification section **18** has the function of selecting the most appropriate mode from multiple DES modes for the specific data format, etc.

#### An Explanation of the DES Mode

Next, a representative block of the previously mentioned DES mode will be explained.

FIG. **3A** is the ECB base mode, and it is a mode that, within the decoding section **7** (DES), encrypts (or decodes) a 64-bit input data string from the 64-bit key data **16** to a 64-bit output data string.

FIG. **3B** shows the CBC mode, which, after a 64-bit input data string is encrypted (or decoded) with the 64-bit key data **16** within the decoding section **7** (DES), once again feedback inputs this data into the decoding section **7** (DES). In this way, this consists of a method for outputting finished results, in which until all of the data has been completely inputted, feedback is performed; this method is suitable for data processing of files, etc.

FIG. **3C** shows the OFB mode, which is suitable for sound data, etc., that can have a significant impact on other data if it contains only a single error, and communications data, which is highly susceptible to error.

FIG. **3D** shows the CFB mode, which is suitable for self-synchronous data.

The previously mentioned mode identification section **18** analyzes data format, etc., and reads out the most suitable of these modes from the mode table **20**, and sends this mode to the decoding section (DES). The decoding section **7** (DES) performs encryption/decoding processing based on the mode that is selected in this way.

#### Details of the Decoding Section

FIG. **4** is a block diagram showing the hardware configuration of the decoding section **7**.

In the diagram, as the input buffer **21** of the input side, a 64-bit register (REG1) that consists of 8 connected registers, each with an 8-bit configuration, is placed, and on the next level selectors (sel) are placed. These selectors (sel) are

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made to input selectively either output from the DES processing main circuit **25** to be discussed below, or output from the previously mentioned shift register (REG1).

Placed on the next level after the selectors (sel) is register **23** (REG2), each register of which has an 8-bit configuration, and placed on the next level is the DES processing main circuit **25**. This DES processing main circuit **25** functions as the DES that is the core of the decoding section **7**. In other words, within the DES processing main circuit **25** is registered as ROM (Read Only Memory) each type of DES mode explained with FIG. **3**. This DES processing main circuit **25** is made to select the optimum DES mode logic through commands from the control CPU **4**, and to perform decoding processing.

Output from the previously mentioned DES processing main circuit **25** branches out to the output register (REG3) that is the output buffer **24** and to the previously mentioned selectors (sel). Then, output from the output register (REG3) is used as either encrypted or decoded data.

The sequence of this processing is shown in FIG. **5**.

In FIG. **5**, output from the input register (the input buffer **21**) undergoes DES processing as output from register **23** with the first clock of the next cycle. Then, it is outputted from the output register (the output buffer **24**) with the next clock. At the time of output from this output register (the output buffer **24**), within the input side is performed a take-in from the input register (the input buffer **21**) of the encrypted data for the next cycle.

In this way, with the present preferred embodiment, through having provided independently the input register (REG1) as the input buffer **21** and the output register (REG3) as the output buffer **24**, both inputting of encrypted data and outputting of decoded data may be performed continuously and independently. As a result, compared with existing DES where input and output is performed cyclically, high-speed encrypting/decoding processing has been made possible.

The decoding section **7** (DES) explained above is controlled by the control CPU **4**; connected to the bus of this control CPU **4**, besides the previously mentioned decoding section **7** (DES), is the monetary charges table **8**, which is comprised of memory, and the interface **72** (I/O).

Within the monetary charges table **8** is registered a prescribed balance value, and monetary charge values are deducted according to the decoding processing amounts or processing time for encrypted software data.

In the case where one wants a balance value updated, as shown in FIG. **6** to be described below, a person brings the software management module **102** that is offered as a card medium to a sales store, etc., and by paying the fees, the person may have the balance value of the monetary charges table increased.

The interface **72** (I/O) is connected to the host CPU **10** exterior to the software management section **3**. Furthermore, the previously mentioned CPU **4** can be made to work together with the host CPU **10** of the host apparatus (in other words, the software reproduction apparatus entity) side.

Output from the software management section **3** is output through the switchover switch **65** (SW4) to the sound-image separation section **66** (DE-MUX: demultiplexer), the image extension section **67a**, and the sound extension section **76b** (MPEG), etc., which comprise a portion of the data conversion section.

Image data separated from sound data with the sound-image separation section **66** (DE-MUX) is extended with the

image extension section 67a (MPEG), converted with the DA conversion section 68a, and is outputted as NTSC signals to an analog display apparatus such as a TV display, etc.

Sound data is extended with the sound extension section 67b (MPEG), converted with the DA conversion section 68b, and outputted as audio signals to an analog audio apparatus such as a speaker, etc. Then, the synchronism of image and sound is controlled by the synchronism control section 70 (VCR).

With the present preferred embodiment, regardless of whether software is encrypted or is not encrypted, it can be uniformly reproduced.

Also, software data from different offering routes can also be manipulated uniformly; if, for example, software data obtained from a CD-ROM or software data obtained from a communications circuit is stored on a writable medium such as the optical magnetic disk 58, etc., through each type of switchover switch, usage and reproduction may be performed when required.

FIG. 2 as explained above is an example of a configuration case in which the CD-ROM 52, the communications circuit 51, and the optical magnetic disk 58 were handled uniformly; however, as shown in FIG. 7, data within a medium that is offered does not have to be encrypted—it may also have an access code given to it.

In other words, in FIG. 7, within a portion of the CD-ROM 76 is registered an access code (AC) for permitting access to this CD-ROM, and only in those cases where this access code (AC) matches a code stored within the apparatus is the usage (reproduction) of the software enabled.

In the diagram, the software management section 3 possesses an access code register 78, and within this access code register 78 is registered an access code for a prescribed medium 76 (or for the data within the medium).

This access code register 78 may be provided within the monetary charges table; in sum, this is a method whereby permission to reproduce is given only in those cases where reproducible software types, data names, etc., are previously registered, and where the medium 76 (CD-ROM or optical magnetic disk MO) on which the permitted data is registered is installed.

When the medium 76 is installed within the drive apparatus, and the data format is converted with the CD/MO demodulator device 60, and error processing has been executed with the magnetic disk/CD-system error processing section 63, the host CPU 10 first reads out an access code from this medium 76.

Next, the host CPU 10 accesses the access code register 78, and performs a retrieval within the key of the access code read out from the medium 76. As a result, in the case where this code was found to be registered within the access code register 78, the host CPU 10 operates the switchover switch 4 and outputs the software data from the medium 76.

With this example, since the data within the medium 76 is not encrypted, high-speed data processing is enabled.

#### An Overall Image of Software Distribution

FIG. 6 shows an overall view of software distribution as realized with the present invention.

Within the present preferred embodiment, software is shipped to the distribution route from a shipment center (here, for simplification, the management center and the shipment center are the same); however, the format at this time may be encrypted software stored on a CD-ROM, or it may be shipped over a communications route, or it may be shipped as an optical magnetic disk, etc.

The end user proceeds to the sales store 27, etc. (communications sales are also permissible), and purchases the CD-ROM 52 as the software storage medium that stores the software. At the same time, the user also purchases an operating application disk 26 such as drive software, etc., that makes this software reproducible on the user's software reproduction apparatus 105, and an SD card that is the software management module (on which is stored the software management section 3 of the present preferred embodiment)

Here, even though the CD-ROM stores multiple software, since this is not a sales method whereby this CD-ROM 52 is to be sold out, the sales price of the CD-ROM itself may be set at a low price. Also, the sales store 27 may also be a rental store.

In other words, within the present invention, all of the software data stored on the CD-ROM 52 is encrypted, and in the case where this data is decoded and reproduced, it is essential that the SD card 102 that maintains a high level of security be used. Also, as will be discussed below, a charge collection system corresponding to the amount of software used is put fully into place. Furthermore, even if the encrypted data stored on the CD-ROM itself is copied onto a separate medium (for example, the optical magnetic disk 58), this alone is meaningless; and even if the CD-ROM is rented, if a charge collection system that corresponds to the amount of software used is fully in place, there will be no decline in the profits of the software provider.

The end user, in the case where he or she desires to reproduce the software stored on this CD-ROM 52 within his or her own software reproduction apparatus 105, first inserts the SD card 102 into the card drive apparatus 28. Then, the user loads both the CD-ROM 52 and the operating application disk 26 into the software reproduction apparatus 105.

Then, the user starts up the communications application (this communications application may also be provided as an operating application) inserted within the software reproduction apparatus 105, and sends from the modem 73 through the home telephone unit 30 a software usage request to the management center 31. In response, the management center 31 encrypts a consent command (key data) for this user and sends it to the software reproduction apparatus 105.

Furthermore, this usage request and usage consent may also take the format of the end user verbally communicating the code with an operator.

The software reproduction apparatus that has received the previously mentioned consent command reads the CD-ROM 52, sequentially decodes the required software through the decoding section 7 (DES) of the SD card, and transmits this software to the program storage area (memory) of the software reproduction apparatus 105.

Along with this, the control CPU 4 counts either the decoded data amount or the decode time for this software, and deducts a monetary charges balance value from the monetary charges table 8. Then, until the monetary charges balance value becomes "0", the control CPU 4 continues decoding processing of decrypted software data.

Here, in the case where the monetary charges balance value of the monetary charges table becomes "0", the control CPU 4 terminates output of encrypted software data. Furthermore, prior to or following termination of output of software data, the user may be warned through image or sound data of a monetary charges balance insufficiency.

What is claimed is:

1. A software reproduction apparatus for reproducing encrypted or non-encrypted software data received via an input route including a storage medium and by communica-

tions with a remote source, and for executing monetary charges according to the usage of the software comprising:

signal processing means for performing unique signal processing based on the input route of the software data; and

error processing means for conducting error processing based on the input route;

input switchover means for selecting an input route, said input switchover means comprising:

first switchover means for outputting encrypted and non-encrypted software data to said signal processing means and;

second switchover means for receiving the output from said signal processing means and directing the output of said signal processing means to said error processing means;

software management means for decoding encrypted software data and for managing monetary charges according to the usage of the software data;

data conversion means for converting decoded data outputted from said software management means to output data offered to the user; and

output route switchover means for receiving encrypted data from said input switchover means and outputting the encrypted data to said software management means, and for receiving non-encrypted software data from said input switchover means and outputting the non-encrypted software data to said data conversion section.

2. The software reproduction apparatus of claim 1 further comprising:

drive apparatus for installing a writable medium;

writing means for writing on to said medium encrypted software data obtained from the said input route prior to its output to said software management means; and

a means for reading encrypted software data written on said medium.

3. The software reproduction apparatus of claim 1 wherein said error processing means is equipped with an error check code generation section for generating new error check codes corresponding to the said writable medium.

4. A software reproduction apparatus for reproducing encrypted or non-encrypted software data received via an input route including a writable medium, a non-writable medium and by communications with a remote source, and for executing monetary charges according to the usage of the software, the software reproduction apparatus comprising:

input switchover means for selecting an input route;

software management means for decoding encrypted software data using key data from an external source and for managing monetary charges according to the usage of the software data;

data conversion means for converting decoded data outputted from said software management means to output data offered to the user; and

output route switchover means and outputting the encrypted data to said software management means, for receiving the non-encrypted software data from said input switchover means and outputting the non-encrypted software data to said data conversion means, and for outputting the encrypted software data to a writable medium.

5. The software reproduction apparatus of claim 4 further comprising:

error management means equipped with an error check code generation section for generating new error check codes corresponding to the writable medium.

6. A software reproduction apparatus for reproducing encrypted or non-encrypted software data received via an input route including a storage medium and by communications with a remote source, and for executing monetary charges according to the usage of the software comprising:

input switchover means for selecting an input route according to the type of medium or communications;

software management means for decoding encrypted software data and for managing monetary charges according to the usage of the software data;

data conversion means for converting decoded data outputted from said software management means to output data for the user;

output route switchover means for receiving encrypted data from said input switchover means and outputting the encrypted data to said software management means, and for receiving non-encrypted software data from said input switchover means and outputting the non-encrypted software data for said data conversion section;

drive apparatus for installing a writable medium;

writing means for writing, on said medium, encrypted software data obtained from the said input route prior to the output of the encrypted software data to said software management means; and

a means for reading encrypted software data written on said medium.

7. A software reproduction apparatus for reproducing encrypted or non-encrypted software data received via an input route including a storage medium and by communications with a remote source, and for executing monetary charges according to the usage of the software comprising:

signal processing means for performing unique signal processing based on the input route of the software data; and

error processing means for conducting error processing based on the input route;

input switchover means for selecting an input route, said input switchover means comprising:

first switchover means for outputting encrypted and non-encrypted software data to said signal processing means and;

second switchover means for receiving the output from said signal processing means and directing the output of said signal processing means to said error processing means;

software management means for decoding encrypted software data and for managing monetary charges according to the usage of the software data;

data conversion means for converting decoded data outputted from said software management means to output data offered to the user;

output route switchover means for receiving encrypted data from said input switchover means and outputting the encrypted data to said software management means, and for receiving non-encrypted software data from said input switchover means and outputting the non-encrypted software data to said data conversion section;

drive apparatus for installing a writable medium;

writing means for writing on said writable medium encrypted software data obtained from the said input route prior to its output to said software management means; and

a means for reading encrypted software data written on said medium.

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8. An apparatus comprising:  
 digital information receiving means for receiving digital information provided via a communication medium;  
 drive means for reading digital information from, and writing digital information to, a storage medium;  
 software management means for decoding encrypted software data and for managing monetary charges according to usage of the decoded software data;  
 information converting means for converting digital information received by said digital information receiving means, digital information read by said drive means, and software data decoded by the software management means, into at least one of visible and audible data;  
 switch means for switching a one-way connection between one of said digital information receiving means and said information converting means, said digital information receiving means and said drive means, said drive means and said information converting means, said digital information receiving means and said software management means, and said drive means and said software management means; and  
 outputting means, connected to said information converting means, outputting the at least one of visible and audible data.

9. The apparatus according to claim 8, wherein said software management means comprises:  
 deciphering means  
 for deciphering digital information received by said digital information receiving means when the digital information is ciphered, and for providing the deciphered digital information to said information converting means for converting, and  
 for deciphering digital information read by said drive means when the digital information is ciphered, and for providing the deciphered digital information to said information converting means for converting.

10. The apparatus according to claim 9, wherein said software management means further comprises:  
 billing managing means  
 for managing billing based on a utilization of the digital information received by said digital information receiving means, and  
 for managing billing based on a utilization of the digital information read by said drive means.

11. The apparatus according to claim 8, wherein said information converting means comprises:  
 extension means  
 for extending digital information received by said digital information receiving means when said digital information is compressed, and  
 for extending said digital information read by said drive means when said digital information is compressed.

12. An apparatus comprising:  
 a digital information receiver receiving digital information provided via a communication medium;  
 a drive device reading digital information from, and writing information to, a storage medium;  
 a software manager decoding encrypted software data and managing monetary charges according to usage of the decoded software data;  
 a converter converting digital information received by said digital information receiver; digital information read by said drive device, and software data decoded by the software manager, into at least one of visible and audible data;

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a switch switching a one-way connection between said digital information receiver and said converter, between said digital information receiver and said drive device, between said drive device and said converter, between said digital information receiver and said software manager, and between said drive device and said software manager; and  
 an output device, connected to said converter, outputting the at least one of visible and audible data.

13. The apparatus according to claim 12, wherein said software manager comprises:  
 a deciphering device  
 deciphering digital information received by said digital information receiver when the digital information is ciphered, and providing the deciphered digital information to said converter, and  
 deciphering digital information read by said drive device when the digital information is ciphered, and providing the deciphered digital information to said converter.

14. The apparatus according to claim 13, wherein said software manager further comprises:  
 a billing manager  
 managing billing based on a utilization of the digital information received by said digital information receiver, and  
 managing billing based on a utilization of the digital information read by said drive device.

15. The apparatus according to claim 12, wherein said converter comprises:  
 an extender  
 extending digital information received by said digital information receiver when said digital information is compressed, and  
 extending said digital information read by said drive device when said digital information is compressed.

16. An apparatus comprising:  
 a communication path providing digital data;  
 a storage medium storing digital data;  
 a converter converting digital data into at least one of visible and audible data;  
 a software manager decoding encrypted software data and managing monetary charges according to usage of the decoded software data, the decoded software data being provided to the converter as digital data to be converted;  
 a switch having  
 a first switch position which connects digital data provided by the communication path to the converter as a one-way connection so that the converter converts the digital data into at least one of visible and audible data,  
 a second switch position which connects digital data read from the storage medium to the converter as a one-way connection so that the converter converts the digital data read from the storage medium into at least one of visible and audible data,  
 a third switch position which connects digital data provided by the communication path to the storage medium as a one-way connection so that the digital data provided via the communication path is stored in the storage medium,  
 a fourth switch position which connects digital data provided by the communication path to the software manager so that the software manager decodes encrypted software data in the provided digital data

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and the converter converts the decoded software data into at least one of visible and audible data, and so that the software manager manages monetary charges according to usage of the decoded software data, and

a fifth switch position which connects digital data read from the storage medium to the software manager so that the software manager decodes encrypted software data of the read digital data and the converter converts the decoded software data into at least one of visible and audible data, and so that the software manager manages monetary charges according to usage of the decoded software data; and

an output device, connected to the converter, outputting the at least one of visible and audible data.

17. The apparatus of claim 16, wherein the software manager comprises:

a deciphering device which,

when the switch is in the first switch position and the digital data provided by the communication path is ciphered, decipheres the digital data before the digital data is provided to the converter, so that the converter receives and converts the deciphered digital data, and,

when the switch is in the second position and the digital data read from the storage medium is ciphered, decipheres the digital data read from the storage medium before the digital data is provided to the converter, so that the converter receives and converts the deciphered digital data.

18. The apparatus according to claim 16, wherein the software manager comprises:

a billing manager managing billing based on a utilization of digital data provided by the communication path, and managing billing based on a utilization of digital data read from the storage medium.

19. The apparatus according to claim 16, wherein the converter comprises:

an extender extending digital data provided by the communication path when the digital data is compressed, and extending digital data read from the storage medium when digital data is compressed.

20. An apparatus comprising:

a communication path providing digital data;

a storage medium storing digital data;

a converter converting digital data into at least one of visible and audible data;

a decoder decoding encrypted digital data;

a switch having

a first switch configuration which, when non-encrypted digital data is provided by the communication path, connects the digital information provided by the communication path to the converter as a one-way connection without passing through the decoder so that the converter converts the digital data into at least one of visible and audible data,

a second switch configuration which, when encrypted digital data is provided by the communication path, connects the digital information provided by the communication path to the converter and the decoder as a one-way connection so that the encrypted digital data is decoded by the decoder and then the decoded digital data is converted by the converter into at least one of visible and audible data,

a third switch configuration which, when non-encrypted digital data is read from the storage

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medium, connects the digital data read from the storage medium to the converter as a one-way connection without passing through the decoder so that the converter converts the digital data into at least one of visible and audible data,

a fourth switch configuration which, when encrypted digital data is read from the storage medium, connects the digital data read from the storage medium to the converter and the decoder as a one-way connection so that the encrypted digital data is decoded by the decoder and then the decoded digital data is converted by the converter into at least one of visible and audible data, and

a fifth switch configuration which connects the digital data provided by the communication path to the storage medium as a one-way connection so that the digital data provided via the communication path is stored in the storage medium;

an output device, connected to the converter, outputting the at least one of visible and audible data; and

a software manager managing monetary charges according to usage of the encrypted digital data decoded by the decoder.

21. A switch comprising:

a first switch position which connects digital data provided by a communication path to a converter as a one-way connection so that the converter converts the digital data into at least one of visible and audible data;

a second switch position which connects digital data read from a storage medium to the converter as a one-way connection so that the converter converts the digital data read from the storage medium into at least one of visible and audible data;

a third switch position which connects the digital data provided by the communication path to the storage medium as a one-way connection so that the digital data provided via the communication path is stored in the storage medium;

a fourth switch position which connects the digital data read from the storage medium to a software manager which decodes encrypted software data in the read digital data and then provides the decoded software data to the converter to be converted into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data; and

a fifth switch position which connects the digital data provided by the communication path to the software manager which decodes encrypted software data in the provided digital data and then provides the decoded software data to the converter to be converted into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data;

wherein an output device, connected to the converter, outputs the at least one of visible and audible data.

22. An apparatus comprising:

first means for connecting digital data provided by a communication path to a converter as a one-way connection so that the converter converts the digital data into at least one of visible and audible data;

second means for connecting digital data read from a storage medium to the converter as a one-way connection so that the converter converts the digital data read from the storage medium into at least one of visible and audible data;



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third means for connecting the digital data provided by the communication path to the storage medium as a one-way connection so that the digital data provided via the communication path is stored in the storage medium;

fourth means for connecting the digital data read from the storage medium to a software manager which decodes encrypted software data in the read digital data and then provides the decoded software data to the converter to be converted into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data;

fifth means for connecting the digital data provided by the communication path to the software manager which decodes encrypted software data in the provided digital data and then provides the decoded software data to the converter to be converted into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data; and

outputting means, connected to the converter, outputting the at least one of visible and audible data.

23. An apparatus comprising:

digital information receiving means for receiving digital information provided via a communication medium;

drive means for reading digital information from, and writing digital information to, a storage medium;

information converting means for converting digital information received by said digital information receiving means and digital information read by said drive means into at least one of visible and audible data;

software management means for decoding encrypted software data and for providing the decoded software data to the information converting means to be converted into at least one of visible and audible data, and for managing monetary charges according to usage of the decoded software data;

switch means for switching a connection between one of said digital information receiving means and said information converting means, said digital information receiving means and said drive means, said drive means and said information converting means, said digital information receiving means and said software management means, and said drive means and said software management means;

selecting means for selecting one of said digital information received by said digital information receiving means and said digital information read by said drive means and inputting the selected digital information to said information converting means to obtain at least one of visible and audible data based on the selected digital information, which is received from different types of digital information sources; and

outputting means, connected to said information converting means, outputting the at least one of visible and audible data.

24. An apparatus comprising:

a communication medium providing external digital information in one direction;

digital information receiving means for receiving digital information provided via the communication medium;

drive means for reading digital information from, and writing digital information to, a storage medium;

information converting means for converting digital information into at least one of visible and audible data;

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software management means for decoding encrypted software data and providing the decoded software data as digital information to the information converting means, and for managing monetary charges according to usage of the decoded software data;

switch means for switching a connection between one of said digital information receiving means and said information converting means so that the information converting means converts the digital information received by the digital information receiving means, said digital information receiving means and said drive means, said drive means and said information converting means so that said information converting means converts the digital information read by the drive means, said digital information receiving means and said software management means so that the software management means decodes software data in the digital information received by the digital information receiving means, and said drive means and said software management means so that the software management means decodes software data in the digital information read by the drive means; and

outputting means, connected to said information converting means, outputting the at least one of visible and audible data.

25. The apparatus according to claim 24, wherein said software management means comprises:

deciphering means

for deciphering digital information received by said digital information receiving means when the digital information is ciphered, and for providing the deciphered digital information to said information converting means for converting, and

for deciphering digital information read by said drive means when the digital information is ciphered, and for providing the deciphered digital information to said information converting means for converting.

26. The apparatus according to claim 25, wherein said software management means further comprises:

billing managing means

for managing billing based on a utilization of the digital information received by said digital information receiving means; and

for managing billing based on a utilization of the digital information read by said drive means.

27. The apparatus according to claim 24, wherein said information converting means comprises:

extension means

for extending digital information received by said digital information receiving means when said digital information is compressed, and

for extending said digital information read by said drive means when said digital information is compressed.

28. An apparatus comprising:

a communication medium providing external digital information in one direction;

a digital information receiver receiving digital information provided via the communication medium;

a drive device reading digital information from, and writing information to, a storage medium;

a software manager decoding encrypted software data, and managing monetary charges according to usage of the decoded software data;

a converter converting digital information received by said digital information receiver, digital information

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read by said drive device, and software data decoded by the software manager, into at least one of visible and audible data;

a switch switching a connection between said digital information receiver and said converter, between said digital information receiver and said software manager, between said drive device and said software manager, between said digital information receiver and said drive device, and between said drive device and said converter; and

an output device, connected to said converter, outputting the at least one of visible and audible data.

29. The apparatus according to claim 28, wherein said software manager comprises:

a deciphering device

a deciphering digital information received by said digital information receiver when the digital information is ciphered, and providing the deciphered digital information to said converter; and

deciphering digital information read by said drive device when the digital information is ciphered, and providing the deciphered digital information to said converter.

30. The apparatus according to claim 29, wherein said software manager further comprises:

a billing manager

managing billing based on a utilization of the digital information received by said digital information receiver, and

managing billing based on a utilization of the digital information read by said drive device.

31. The apparatus according to claim 28, wherein said converter comprises:

an extender

extending digital information received by said digital information receiver when said digital information is compressed, and

extending said digital information read by said drive device when said digital information is compressed.

32. An apparatus comprising:

a communication path providing external digital data in one direction;

a storage medium storing digital data;

a software manager decoding encrypted software data and managing monetary charges according to usage of the decoded software data;

a converter converting digital data into at least one of visible and audible data;

a switch having

a first switch position which connects digital data provided by the communication path to the converter, the converter converting the digital data into at least one of visible and audible data,

a second switch position which connects digital data read from the storage medium to the converter, the converter converting the digital data read from the storage medium into at least one of visible and audible data,

a third switch position which connects digital data provided by the communication path to the storage medium, the digital data provided via the communication path being stored in the storage medium,

a fourth switch position which connects digital data provided by the communication path to the software manager so that the software manager decodes encrypted software data in digital data

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provided by the communication path and provides the decoded software data to the converter so that the converter converts the decoded software data into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data, and

a fifth switch position which connects digital data read from the storage medium to the software manager so that the software manager decodes encrypted software data in digital data read from the storage medium and provides the decoded software data to the converter so that the converter converts the decoded software data into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data; and

an output device, connected to the converter, outputting the at least one of visible and audible data.

33. The apparatus according to claim 32, wherein the software manager comprises:

a deciphering device which,

when the switch is in the first switch position and the digital data provided by the communication path is ciphered, decipheres the digital data before the digital data is provided to the converter, so that the converter receives and converts the deciphered digital data, and,

when the switch is in the second position and the digital data read from the storage medium is ciphered, decipheres the digital data read from the storage medium before the digital data is provided to the converter, so that the converter receives and converts the deciphered digital data.

34. The apparatus according to claim 32, wherein the software manager comprises:

a billing manager managing billing based on a utilization of digital data provided by the communication path, and managing billing based on a utilization of digital data read from the storage medium.

35. The apparatus according to claim 32, wherein the converter comprises:

an extender extending digital data provided by the communication path when the digital data is compressed, and extending digital data read from the storage medium when digital data is compressed.

36. An apparatus comprising:

a communication path providing external digital data in one direction;

a storage medium storing digital data;

a converter converting digital data into at least one of visible and audible data;

a decoder decoding encrypted digital data;

a software manager managing monetary charges according to usage of digital data decoded by the decoder;

a switch having

a first switch configuration which, when non-encrypted digital data is provided by the communication path, connects the digital information provided by the communication path to the converter without passing through the decoder, the converter converting the digital data into at least one of visible and audible data,

a second switch configuration which, when encrypted digital data is provided by the communication path,

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connects the digital information provided by the communication path to the converter and the decoder, the encrypted digital data being decoded by the decoder and then the decoded digital data being converted by the converter into at least one of visible and audible data,

a third switch configuration which, when non-encrypted digital data is read from the storage medium, connects the digital data read from the storage medium to the converter without passing through the decoder, the converter converting the digital data into at least one of visible and audible data,

a fourth switch configuration which, when encrypted digital data is read from the storage medium, connects the digital data read from the storage medium to the converter and the decoder, the encrypted digital data being decoded by the decoder and then the decoded digital data being converted by the converter into at least one of visible and audible data, and

a fifth switch configuration which connects the digital data provided by the communication path to the storage medium, the digital data provided via the communication path being stored in the storage medium; and

an output device, connected to the converter, outputting the at least one of visible and audible data.

37. A switch comprising:

a first switch position which connects external digital data provided by a communication path in one direction to a converter that converts the digital data into at least one of visible and audible data;

a second switch position which connects digital data read from a storage medium to the converter, the converter converting the digital data read from the storage medium into at least one of visible and audible data;

a third switch position which connects the digital data provided by the communication path to the storage medium, the digital data provided via the communication path being stored in the storage medium;

a fourth switch position which connects digital data read from the storage medium to a software manager which decodes encrypted software data in the read digital data and then provides the decoded software data to the converter to be converted into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data; and

a fifth switch position which connects the digital data provided by the communication path to the software manager which decodes encrypted software data in the provided digital data and then provides the decoded software data to the converter to be converted into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data;

wherein an output device, connected to the converter, outputs the at least one of visible and audible data.

38. An apparatus comprising:

first means for connecting external digital data provided by a communication path in one direction to a converter that converts the digital data into at least one of visible and audible data;

second means for connecting digital data read from a storage medium to the converter, the converter converting the digital data read from the storage medium into at least one of visible and audible data;

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third means for connecting the digital data provided by the communication path to the storage medium, the digital data provided via the communication path being stored in the storage medium;

fourth means for connecting digital data read from the storage medium to a software manager which decodes encrypted software data in the read digital data and then provides the decoded software data to the converter to be converted into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data;

fifth means for connecting the digital data provided by the communication path to the software manager which decodes encrypted software data in the provided digital data and then provides the decoded software data to the converter to be converted into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data; and

outputting means, connected to the converter, outputting the at least one of visible and audible data.

39. An apparatus comprising:

a communication medium providing external digital information in one direction;

digital information receiving means for receiving digital information provided via the communication medium;

drive means for reading digital information from, and writing digital information to, a storage medium;

software management means for decoding encrypted software data and for managing monetary charges according to usage of the decoded software data;

information converting means for converting digital information received by said digital information receiving means, digital information read by said drive means, and software data decoded by said software management means, into at least one of visible and audible data;

switch means for switching a connection between one of said digital information receiving means and said information converting means, said digital information receiving means and said drive means, said digital information receiving means and said software management means, said drive means and said software management means, and said drive means and said information converting means;

selecting means for selecting one of said digital information received by said digital information receiving means and said digital information read by said drive means and inputting the selected digital information to said information converting means to obtain at least one of visible and audible data based on the selected digital information, which is received from different types of digital information sources; and

outputting means, connected to said information converting means, outputting the at least one of visible and audible data.

40. A switch comprising:

a first switch position which connects digital data provided by a communication path to a converter so that the converter converts the digital data into at least one of visible and audible data;

a second switch position which connects digital data read from a storage medium to the converter so that the converter converts the digital data read from the storage medium into at least one of visible and audible data;

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a third switch position which connects digital data provided by the communication path to the storage medium so that the digital data provided by the communication path is stored in the storage medium;

a fourth switch position which connects digital data read from the storage medium to a software manager which decodes encrypted software data in the read digital data and then provides the decoded software data to the converter to be converted into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data; and

a fifth switch position which connects the digital data provided by the communication path to the software manager which decodes encrypted software data in the provided digital data and then provides the decoded software data to the converter to be converted into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data.

41. An apparatus comprising:

means for connecting digital data provided by a communication path to a converter so that the converter converts the digital data into at least one of visible and audible data;

means for connecting digital data read from a storage medium to the converter so that the converter converts

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the digital data read from the storage medium into at least one of visible and audible data;

means for connecting digital data provided by the communication path to the storage medium so that the digital data provided by the communication path is stored in the storage medium;

means for connecting digital data read from the storage medium to a software manager which decodes encrypted software data in the read digital data and then provides the decoded software data to the converter to be converted into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data; and

means for connecting digital data provided by the communication path to the software manager which decodes encrypted software data in the provided digital data and then provides the decoded software data to the converter to be converted into at least one of visible and audible data, wherein the software manager manages monetary charges according to usage of the decoded software data.

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UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : RE 40,547 E  
APPLICATION NO. : 09/654929  
DATED : October 21, 2008  
INVENTOR(S) : Ryota Akiyama et al.

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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

First Page, Column 1 (Inventors), Line 2, change “Kanagawa” to --Yokohama--.

Column 9, Line 56, after “means” insert --for receiving encrypted data from said input switchover means--.

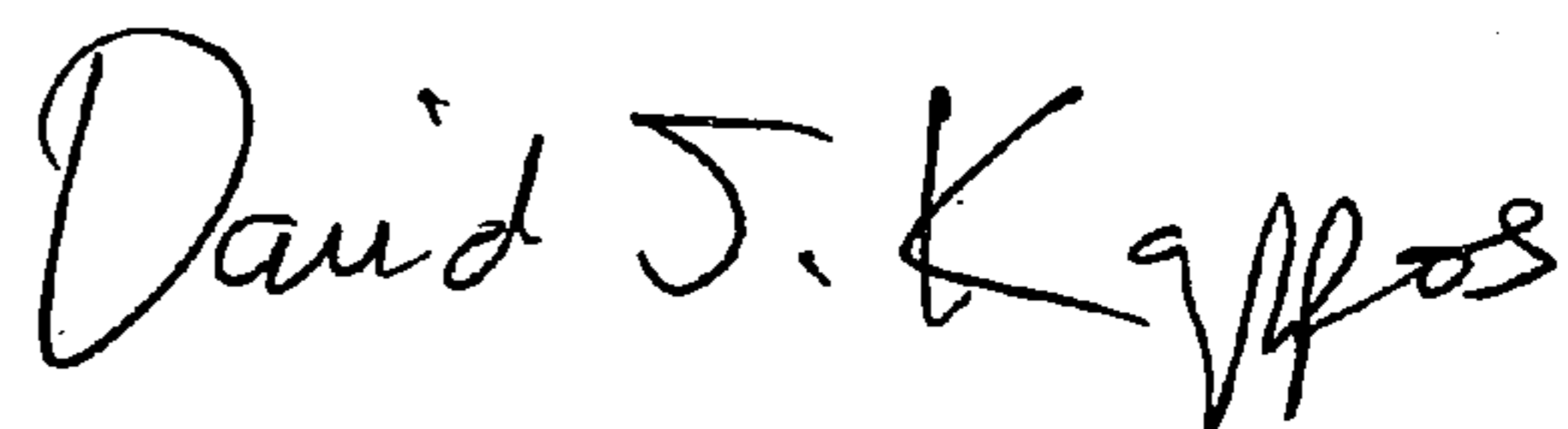
Column 11, Line 64, change “receiver;” to --receiver,--.

Column 13, Line 16, change “of” to --according to--.

Column 17, Line 16, before “deciphering” delete “a”.

Signed and Sealed this

Twenty-second Day of June, 2010

A handwritten signature in black ink that reads "David J. Kappos". The signature is written in a cursive, flowing style.

David J. Kappos  
*Director of the United States Patent and Trademark Office*