SEARCH SYSTEM, SEARCH DEVICE AND METHOD, AND INPUT DEVICE AND METHOD

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a search system, search device and method, and input device and method which can search and obtain broadcasted information precisely after having been broadcasted.

2. Description of the Related Art

There have hitherto been some data base systems for searching data which are set as a data base and accumulated on a computer system. A user gains desired information by operating a terminal device which is connected to a data base system directly or through a network. For example, the user inputs from the terminal device a keyword which seems to be proper. The data base system carries out a search operation on the basis of the input keyboard and supplies the search result through the terminal device to the user. When the amount of information thus supplied is large, the user further sets a keyword for the information thus supplied, whereby the user can perform a narrower search operation.

Here, a case where a user search music data by using a data base system in which music data are accumulated will be described. For example, on the basis of a search result, the

user can know title information, etc. of a CD (Compact Disc) in which desired music pieces are recorded, and consider then when the user purchase the CD. Here, the music data is information on music pieces, and it comprises various information such as the titles of music pieces, the names of players, a record album title, that is, the title of the music CD, a open-public year, a selling agency, etc. The music data may contain the audio data of the music data themselves. In the data base system, for each music data, some keywords for appendant information to the music data such as the player name of the music piece, the title, the record album title, are set.

For example, it is assumed that a user likes a music piece which is being broadcasted accidentally on a radio broadcast and the user wishes to obtain information on the music piece. In this case, after the broadcast, the user searches the music piece by using a music data base as described above. For example, the user sets keywords and performs the search operation on the basis of appendant information of the music piece obtained through an announcer's introduction broadcasted together with the music piece.

In the conventional music data base as described above, if the keywords are not properly input, a desired result could not be obtained. Accordingly, in the related art, there is a problem that the user could not obtain desired information if the user forgets appendant information of a favorite music piece

broadcasted together with the music piece when the user performs a search operation.

There is also considered a case where a user carries a terminal device for searching a music data base at all times and performs a search operation through the terminal device whenever the user's favorite music piece is rolled out through a radio broadcast. However, it is very cumbersome to carry the terminal device for search at all times.

Further, there frequently occurs a case where a user starts to listen to a music piece from some midpoint thereof and likes the music piece. In such a case, the user cannot know the appendant information of the music piece, and thus there is a problem that even when the user is about to carry out the search operation by using the terminal device for search, the user cannot know which should be input as a keyword.

Still further, in case of digital broadcast, it may be considered that appendant information is superposed on music data broadcasted. With this operation, the user can obtain the information on the music piece broadcasted as digital data. However, in this case, there is a problem that it is necessary to create and superpose appendant information every music data to be transmitted at a broadcast station side, and thus a large load is imposed on the broadcast station side. There is also a problem at the user side that it is necessary to prepare a reception device which is designed to pick up the appendant

information thus superposed.

SUMMARY OF THE INVENTION

Example embodiments may provide a search system, search device and method, and input device and method which can perform a necessary search operation even when a user does not know a correct keyword when a broadcasted content is searched.

In accordance with a first aspect of the present invention, there is provided a search system for searching related information associated with a broadcast content, comprising: a communication apparatus comprising, a operation unit; a counter; and a communication unit configured to transmit a count value by said counter to a search apparatus, said count value being used for generating a differential time between an operate time of said operation unit and a transmitting time of said count value, the search apparatus comprising, a timer configured to output a current time; a storage device configured to store related information associated with said broadcast content and a broadcast time of said broadcast content; a differential time generator configured to generate said differential time according to said count value transmitted from said communication unit; a operate time calculator configured to calculate said operate time of said operation

unit according to said current time from said timer and said differential time generated by said differential time generator; and a search unit configured to search related information of said broadcast content broadcasted on said operate time from said storage device based on said operate time calculated by said operate time calculator.

In accordance with a second aspect of the present invention, there is provided a communication apparatus configured to transmit information used for calculating a broadcast time to a search apparatus having a storage device configured to store related information associated with a broadcast content and a broadcast time of said broadcast content, said search apparatus being configured to search related information of said broadcast content based on a broadcast time from said storage device, comprising: a operation unit; a counter; and a communication unit configured to transmit a count value by said counter to a search apparatus, said count value being used for calculating a differential time between an operate time of said operation unit and a transmitting time of said count value, wherein said search apparatus calculates said broadcast time based on said count value.

In accordance with a third aspect of the present invention, there is provided a search apparatus for searching related information associated with a broadcast

content, comprising: a timer configured to output a current time; a storage device configured to store related information associated with said broadcast content and a broadcast time of said broadcast content; a differential time generator configured to generate a differential time between an operate time of a operation unit of a communication apparatus and a transmitting time of a count value according to said count value transmitted from said communication apparatus including a counter; a operate time calculator configured to calculate said operate time of said operation unit according to said current time from said timer and said differential time generated by said differential time generator; and a search unit configured to search related information of said broadcast content broadcasted on said operate time from said storage device based on said operate time calculated by said operate time calculator.

In accordance with a fourth aspect of the present invention, there is provided a search system for searching related information associated with a broadcast content, comprising: a communication apparatus comprising: a operation unit; and a communication unit configured to transmit request information for requesting to search said related information to a search apparatus after a operate time of said operation unit, the search apparatus comprising: a timer configured to output a current time; a

storage device configured to store related information associated with said broadcast content and a broadcast time of said broadcast content; a operate time calculator configured to calculate said operate time of said operation unit by going back to a predetermined time from a transmitting time of said request information from said communication unit; a search unit configured to search related information of said broadcast content broadcasted on said operate time from said storage device based on said operate time calculated by said operate time calculator.

In accordance with a fifth aspect of the present invention, there is provided a communication apparatus configured to transmit information used for calculating a broadcast time to a search apparatus having a storage device configured to store related information associated with a broadcast content and a broadcast time of said broadcast content, said search apparatus being configured to search related information of said broadcast content based on a broadcast time from said storage device, comprising: a operation unit; a receiving unit configured to receive a broadcast signal broadcasted on a broadcast station tuned in based on an operation for said operation unit; a reproducing unit configured to receive a broadcast signal outputted from said receiving unit; a communication unit configured to transmit request information for requesting to

search said related information and broadcast station information indicating said tuned broadcast station; and wherein said communication apparatus comprises recording unit configured to record said music data onto a recording medium, said communication unit receives related information transmitted from said search apparatus, said communication unit transmits request information for requesting a download of music data associated with said related information to said search apparatus according to an input from said operation unit.

In accordance with a sixth aspect of the present invention, there is provided a search apparatus for searching related information associated with a broadcast content, comprising: a timer configured to output a current time; a storage device configured to store related information associated with said broadcast content and a broadcast time of said broadcast content; a operate time calculator configured to calculate an operate time of said operation unit by going back to a predetermined time from a transmitting time of a request information for requesting to search related information from said communication apparatus including said operation unit; a search unit configured to search related information of said broadcast content broadcasted on said operate time from said storage device based on said operate time calculated by said

operate time calculator.

Also disclosed is a search system for searching a broadcasted content is characterized by comprising: an input device including a storage means for storing time information representing at least a content broadcast time by a predetermined operation, and communication means for transmitting the time information stored in the storage means to the outside; and a search device including accumulating means for accumulating information representing a content and the broadcast time of the content while associating the information and the broadcast time with each other, and search means for receiving the time information transmitted by the communication means, and searching information representing the content accumulated in the accumulating means on the basis of the time information thus received.

Also disclosed is a search device for searching a broadcasted content,

is characterized by comprising: accumulating means for accumulating information representing a content and a broadcast time of the content in association with each other; and search means for searching the information representing the content accumulated in the accumulating means on the basis of at least the time information which is input from an input device and represents the time at which the content is broadcasted.

Also disclosed is an input device which is provided with accumulation means for accumulating information representing a content and a broadcast time of the content in association with each other and inputs time information to a search device for searching information representing a content accumulated in the accumulation means on the basis of the time information at which the content is broadcasted, is characterized by comprising: storage means for storing at least the time information representing the content broadcast time by a predetermined operation; and communication means for transmitting the time information stored in the storage means to the outside.

Also disclosed is an input device which is provided with accumulation means for accumulating information representing a content and a broadcast time of the content in association with each other and inputs time information to a search device for searching information representing a content accumulated in the accumulation means

on the basis of the time information at which the content is broadcasted, is characterized by comprising: a counter which through a predetermined operation at least the count value of the count at the time when the content is broadcasted, and communication means for transmitting the count value stored in the storage means to the outside.

Also disclosed is a search method of searching a broadcasted content, is characterized by comprising: a step of accumulating information representing a content and a broadcast time of the content in association with each other into accumulation means; a step of storing at least time information representing a content broadcast time into storage means by a predetermined operation; a communication step of transmitting the time information stored in the storage means to the outside; and a search step of receiving the time information transmitted by the communication step, and searching the information representing the content accumulated in the accumulation means on the basis of the time information thus received.

Also disclosed is a search method of searching a broadcasted content, is characterized by comprising: a step of accumulating information representing a content and a broadcast time of the content in association with each other into an accumulation

means; a step of storing at least time information representing a content broadcast time into storage means by a predetermined operation; a communication step of transmitting the time information stored in the storage means to the outside; and a search step of receiving the time information transmitted by the communication step, and searching the information representing the content accumulated in the accumulation means on the basis of the time information thus received.

Also disclosed is an input method which includes accumulation means for accumulating therein information representing a content and a broadcast time of the content in association with each other, and inputs time information to a search device for searching information representing the content accumulated in the accumulation means on the basis of the time information representing the content broadcast time, is characterized by comprising a step of storing at least time information representing the content broadcast time into storage means by a predetermined operation, and a communication step of transmitting the time information stored in the storage means to the outside.

Also disclosed is an input method which includes accumulation means for accumulating information representing a content and broadcast time of the content in association with each other

and with which on the basis of time information on the broadcast of a content, the information corresponding to the time is input to a search device for searching information representing a content accumulated in the accumulation means, is characterized by comprising a counter operated with a predetermined clock, a step of storing into storage means at least a count value of the counter at the time when a content is broadcasted, through a predetermined operation, and a communication step of transmitting the count value stored in the storage step to the outside.

In example embodiments, the time information at which the content is broadcasted, which is stored in the input device, is transmitted to the search device by the communication means, and the information representing the content which is accumulated in the accumulation means in association with the broadcast time of the content is searched in the search device, so that the information representing the content can be obtained through the search based on the time information.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic diagram showing an information search system according to the present invention;

Fig. 2 is a schematic diagram showing an example of the construction of a music piece data search system according to

the first embodiment;

Fig. 3 is a schematic diagram showing a play list;

Fig. 4 is a schematic diagram showing the outlook of an assistance terminal, that is a book marker according to the first embodiment;

Fig. 5 is a block diagram showing an example of the book marker construction according to the first embodiment;

Fig. 6 is a schematic diagram showing an example of time information stored in a memory of the book marker;

Fig. 7 is a block diagram showing an example of the construction of a gateway device;

Fig. 8 shows an example of a display of a user and a registration frame of the book maker owned by the user in the gateway device;

Fig. 9 is an example a flowchart showing of content search processing of the present invention;

Fig. 10 is a schematic diagram showing an example of the display frame of the gateway device according to the first embodiment;

Fig. 11 is a block diagram showing an example of the construction of a book marker installed in a radio receiver according to a second embodiment;

Fig. 12 is a schematic diagram showing an example of the construction of a search system according to a second embodiment;

Fig. 13 is a schematic diagram showing an example of the display frame of the gateway device according to the second embodiment;

Fig. 14 is a schematic diagram showing the construction of a search system according to a modification of the second embodiment;

Fig. 15 is a block diagram showing an example of the construction in which a radio receiver is installed in a general personal computer; and

Fig. 16 is a block diagram showing an example of the construction of a detection circuit for detecting the electric wave corresponding to a reception frequency of a receiver.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments according to the present invention will be described hereunder with reference to the accompanying drawings.

First, the summary of the invention will be described. Fig. 1 schematically shows an information search system of the present invention. The system comprises two data bases 1 and 2, a search engine 3 for performing a search operation on these data bases 1 and 2, and an assistance terminal 4 for supplying an assistance on a search condition to a user.

In the data base 1 is accumulated information relevant to broadcast media of contents which are broadcasted by

broadcast media such as a radio broadcast or the like. For example, the titles of music pieces broadcasted by radio broadcast stations, the broadcast time information of the music pieces and broadcast station information are accumulated in association with one another in the data base 1. It is needless to say that information on contents of broadcast media other than the radio broadcast may be accumulated in the data base 1, or the contents are not limited to the information on the music pieces, but they may be information on commercial articles.

In the following description, it is assumed that the broadcast media is a radio broadcast and the content supplied from the broadcast media is a music piece.

In the data base 2 is accumulated information on the content itself to be accumulated in the data base 1. For example, when the content is a music piece broadcasted by the broadcast media, information on the content itself such as the title of an album (CD) in which the music piece is recorded, player information, a selling agency, a selling date, etc. is accumulated in association with the title of the music piece. In addition, client information on this system may be accumulated in the data base 2. ID information of clients based on identification information inherent to an assistance terminal 4 described later, and other information on the clients are accumulated in the data base 2.

The search engine 3 searches information accumulated in the data base on the basis of a search condition indicated by a user. The engine described here means an assembly for supplying specific functions, and the search engine 3 supplies a predetermined search function to the user.

For example, when the user likes a music piece broadcasted from a radio, the user indicates place information 5, broadcast station information 6 and time information 7 as a search condition to the search engine 3 if the user knows a broadcast station and a place at which the music piece is broadcasted, and a broadcast time. The search engine 3 searches the data base 1 on the basis of the search condition thus set, and outputs the title of the music piece as a search result. The data base 2 is searched while the title of the music piece is set as the search condition, and, for example, the title of an album in which the music piece is recorded, the information on the selling agency and players of the album, etc. are output. The search result of the data base 2 is returned to the user.

There is a case where a user does not know the above information 5, 6 and 7 as a search condition or the information is vague even when the user listens to a broadcast and wishes to search a favorite music piece. In the present invention, the user owns the assistance terminal 4 for obtaining the time information 7 in advance. In addition, the place information 5 and the broadcast station information 6 which corresponds to

the user are registered as client information in the data base 2 in advance.

That is, when the user likes the broadcasted music piece, the user operates the assistance terminal 4 and stores the time information 7' at that time into the assistance terminal 4. Thereafter, on the basis of the time information 7' stored in the assistance terminal 4, the user instructs the search engine 3 to perform the search operation. The search engine 3 searches the data base 1 by using as the search condition the time information 7' and the place information 5 and the broadcast information 6 of the user which are beforehand registered in the data base 2. The data base 2 is searched on the basis of the title of the music piece obtained as the search result. The search result thus output is returned to the user as a candidate of information desired by the user.

As described above, by using the system according to the present invention, the user can operate the assistance terminal 4 to store the time information 7' into the assistance terminal 4 to obtain user's desired information when the user likes a music piece broadcasted.

Next, a first embodiment according to the present invention will be described. Fig. 2 shows an example of the construction of a music piece data search system according to the first embodiment. In Fig. 2, the common parts as shown in Fig. 1 are represented by the same reference numerals, and the

detailed description thereof is omitted. A book mark search engine 10 is constructed by the data base 1, the data base 2 and the search engine 3. The book mark search engine 10 is connected to another site (not shown) through a communication line such as Internet or the like.

The site means a place at which information open to the public on the network is placed, and the book mark search engine 10 thereof is also one site. For example, the book mark search engine 10 is connected to a data base (not shown) as another site.

The broadcast station 12 is a radio broadcast station, for example, and it broadcasts music pieces as contents on the basis of a play list which is prepared in advance. The play list may be prepared after the broadcast. It is needless to say that not only music pieces, but also article or other information may be broadcasted as contents. Further, the broadcast station 12 is not limited to a radio broadcast station, but may be a television broadcast station or CATV (Cable Television) station which performs a television broadcast in a radio or wire mode, a wire broadcast station for mainly broadcasting music pieces in a wire mode or the like.

The book mark search engine 10 and the broadcast station 12 are connected to each other through a communication line such as Internet or the like. The above-described play list is transmitted from the broadcast station 12 to the book mark

search engine 10. In the book mark searching engine 10, the play list thus received is accumulated into the data base 1. Fig. 3 shows an example of the play list. In the case of Fig. 3, with one content, that is, the music corresponding to one music piece broadcasted is associated the name of the broadcast station 12 from which the content is broadcasted (Station Name), the broadcast area of the broadcast station 12 (Area), a broadcast start time (Start Time) of the content (music piece), a broadcast end time (End Time) of the content and the name of the content (Content).

The play list to be accumulated into the data base 1 is not necessarily transmitted from the broadcast station 12 by which the content is actually broadcasted. For example, a play list which is prepared by manually collecting broadcasted information may be supplied to the data base 1 through a predetermined storage medium and accumulated therein. Further, a play list may be prepared by a system different from that of the broadcast station 12 to transmit to the book mark search engine 10. Play lists of plural different broadcast stations 12 may be accumulated in the data base 1 so that the respective broadcast stations 12 can be identified.

The book mark search engine 10 and the gateway device 11 are interactively connected to each other through the communication line 8 such as Internet or the like. As described in more detail later, the gateway device 11 is a personal

computer, for example. It interactively communicates with the book mark search engine 10, while communicating with the assistance terminal 4 owned by the user.

The gateway device 11 is not limited to personal computers. For example, a set top box provided to connect a television receiver and a digital network may be used as the gateway device 11, for example. In another case, IRD (Integrated Receiver Decoder) serving as a digital broadcast receiver may be used as the gateway device 11.

Fig. 4 shows an example of the outlook of the assistance terminal 4 according to the first embodiment. In the following description, the assistance terminal 4 is referred to as a book marker 4. The book marker 4 has, for example, an input unit 20 comprising a button, and a display unit 21 on which the current time is displayed. Further, it is provided with a connector 22 which serves as an electrical connection point when a communication with the gateway device 11 described above is performed.

The book marker 4 has a simple construction as described later, and it can be accommodated in a compact housing, like one used as a key holder. The book marker 4 is not limited to the above case, and it may be installed into various other electronic equipment. For example, as described later, the book marker 4 may be incorporated in a radio receiver. It may be mounted in a car stereo system. It is needless to say that a

target in which the book marker 4 is installed is not limited to the electronic equipment. The book marker 4 is preferably installed in something which is used while moving or portably used.

Fig. 5 shows an example of the construction of the book marker 4 according to the first embodiment. Omitted from this figure, CPU (Central Processing Unit) 25 has a memory, a bus, a predetermined interface, etc. CPU 25 is connected to a button 20, a display unit 21, a memory 26, a timer 28 and an interface 29. The timer 28 is designed to output the current time, and can be corrected by the control of the CPU 25. The display unit 21 comprises, for example, LCD (Liquid Crystal Display), and the display thereof is controlled by CPU 25. Time information output from the timer 28 is supplied to the display unit 21 through CPU 25, and displayed. The display unit 21 may be omitted.

A user's operation of the button 20 is detected by CPU 25, and the time information at that time is stored into the memory 26 on the basis of the output of the timer 28. As shown in Fig. 6, a plurality of time information pieces may be stored in the memory 26. For example, symbols based on serial numbers are provided to the respective time information pieces so as to discriminate the time information pieces from one another. A terminal ID 27 stored in a predetermined area of the memory 26 is a unique ID which can specify each individual book marker

4.

The interface 29 controls the communication with the external, that is, the gateway device 11 through the connector 22. No specific limitation is imposed on the interface standards of the interface 20 when the communication with the gateway device 11 is performed. For example, USB (Universal Serial Bus) may be used as the interface standards for the communication between the book marker 4 and the gateway device 11. Besides, the interface standards defined in IEEE-1394 may be used. Further, RS-232C may be used as the interface standards for this communication.

The communication is not limited to the wire communication, and the communication between the book marker 4 and the gateway device 11 may be performed with infrared ray signals by using the interface standards based on IrDA (Infrared Data Association). In this case, the connector 22 and the interface 29 are designed to have a transmission/reception function of infrared ray signals.

The book marker 4 may be constructed as an IC card obtained by embedding an integrated circuit and communication means in a card, or a PC card defined by PCMCIA (Personal Computer Memory Card International association) and JEIDA (Japan Electronic Industry Development Association). When the book marker 4 is constructed as an IC card, the interface standards which are conformed with the IC card concerned are used as the interface

29. When the book marker 4 is constructed as a PC card, a connector which is conformed with the PC card is provided to the gateway device 11, for example. The communication between the book marker 4 and the gateway device 11 can be performed by directly mounting the book marker 4 as the PC card in the connector which is conformed with the PC card.

The terminal ID 27 and the time information stored in the memory 26 can be read out from the memory 26 and output through the interface 29 to the outside on the basis of an instruction of CPU 25.

Fig. 7 shows an example of the construction of the gateway device 11. As described above, a general personal computer may be used as the gateway device 11. Fig. 7 shows a case where a general personal computer is used as the gateway device 11. CPU 31, ROM (Read Only Memory) 32, RAM (Random Access Memory) 33, a display control circuit 34 and a storage medium, for example, a hard disc 36 are connected to a bus 30. Input means 91 comprising, for example, a key board and a prescribed type of pointing device which can output a control signal based on a user's operation is also connected to the bus 30. CPU 25 operates on the basis of a program stored in ROM 32 or a hard disc 36, and performs predetermined processing on the basis of the operation of the input means 91 by the user. RAM 33 is used, for example, as a work memory for CPU 31. The display control signal output from CPU 25 is supplied to the display control

circuit 34 to perform a display operation based on the display control signal on a display 35.

Further, an interface 37 to perform the communication with the book marker 4 is connected to the bus 30. As the interface 37 is used something which is conformed with the interface standards supporting the interface 29 of the book marker 4, such as USB, IEEE-1394, RS-232C, IrDA, etc.

Communication means 38 to perform the communication with the book mark search engine 10 through the communication line 8 is further connected to the bus 30. The communication means 38 is a modem or the like, and connected to a public telephone line as the communication line 8. The gateway device 11 is connected to the Internet through the public telephone line, for example, by using a modem, and can perform the interactive communication with the book mark search engine 10 through the Internet.

Sound processing means 39 connected to the bus 30 converts digital audio data supplied through the bus 30 to analog audio signals. The analog audio signals output from the sound processing means 39 are reproduced by a speaker 90.

As described above, it is necessary for the user to register the information of the user himself into the client data base 2 of the book mark search engine 10 in advance. The registration may be performed by using the gateway device 11. First, the user connects the book marker 4 thereof to the gateway

device 11 by a prescribed interface. The user then operates the gateway device 11 to register the user and the book marker 4 owned by the user.

Fig. 8 shows an example of a display on a registration frame 40 of the display 35 when the user and the book marker 4 owned by the user are registered. The name of the user is input to a "Name" column 41. The terminal ID 27 of the book marker 4 owned by the user is input to a "book mark ID" column 42.

The input of the terminal ID 27 described above is performed by the communication between the gateway device 11 and the book marker 4. That is, a request for reading out the terminal ID 27 is transmitted from the gateway device 11 to the book marker 4. Under the control of CPU 25 based on this request, the terminal ID 27 is read out from the memory 26 in the book marker 4. The terminal ID 27 thus read out is transmitted to the gateway device 11. In the gateway device 11, the terminal ID 27 thus received is displayed on the "book mark ID" column 42 of the display 35, and also stored in RAM 33.

Further, a post code and a telephone number for toll call of a place at which a user resides are input to a "post code" column 43 and a "telephone number for toll call" column 44, respectively. An area in which the user acts is schematically shown on the basis of the contents input to the columns 43 and 44. With respect to the user's activity area, not only the post code and the toll call telephone number, but also information

representing a geographical area may be input. An area name which is independently set in advance may be input. Information for specifying a radio station which is frequently selected by the user is input to a "radio station" column 45. In this case, the name of the broadcast station is input. However, it is not limited to the broadcast station name, but the frequency band of a radio broadcast may be input.

A user's credit card number or cash card number is input to a "card No." column 46. The address of the user is accurately input to an "address" column 47. These are information used when a service using the book marker 4 is followed by money charging processing.

Each information input to the columns 41 to 47 as described above is stored in RAM 33. On the basis of a prescribed operation, it is read out from RAM 33, and transmitted to the book mark search engine 10 by the communication means 38. At this time, it is more preferable that each information to be transmitted is encrypted by a prescribed method.

The timer 28 is corrected in the book marker 4. For example, when the book marker 4 and the gateway device 11 are connected to each other to register the terminal ID 27, the interactive communication is carried out between the book marker 4 and the gateway device 11, the timer 28 of the book marker 4 can be corrected by using the time information output from the timer (not shown) owned by the gateway device 11.

The same processing may be performed by a unidirectional communication from the book marker 4 to the gateway device 11. The book marker 4 and the gateway device 11 are connected to each other to transmit the terminal ID 27 from the book marker 4 to the gateway device 11. In addition, the time information based on the timer 28 is transmitted from the book marker 4 to the gateway device 11. At the gateway device 11 side, the time information transmitted and the time information represented by the timer (not shown) owned by the gateway device 11 may be compared with each other to calculate the correct time by using the difference therebetween.

In these cases, it is required that the time information based on the timer (not shown) of the gateway device 11 is corrected to a correct time by using some method.

In the foregoing description, the book marker 4 has a timer. However, the present invention is not limited to this embodiment. For example, a counter which operates with a predetermine period of clocks may be provided with the book marker 4 to determine the time information representing the push time of the button 20 on the basis of the count value of the counter. For example, the count value when the user operates the button 20 is stored in the memory 26. When the book marker 4 is connected to the gateway device 11 and the count value stored in the memory 26 is transmitted to the gateway device 11, the count value at the transmission time is transmitted to the

gateway device 11 together with the count value read out from the memory 26.

Besides, the gateway device 11 corrects the timer (not shown) by using a predetermined method to obtain a master clock. For example, the gateway device 11 communicates with the book mark search engine 10 through the communication line 8 by the communication means 38 to obtain time information, and corrects the timer of the gateway device 11 on the basis of the time information. Further, the gateway device 11 may be provided with predetermined reception means to receive time information contained in a television broadcast or radio broadcast and correct the timer of the gateway device 11 on the basis of the time information thus received.

In the gateway device 11 is calculated the differential count value between the count value which is obtained when the user pushes the button 20 and transmitted from the book marker 4 and the count value when the transmission from the book marker 4 is carried out. If a count-up period of the counter of the book marker 4 is known in advance, on the basis of the timer of the gateway device 11 for generating the master clock, the timer is turned back by the time corresponding to the differential count value with respect to the time at which the transmission from the book marker 4 is carried out, thereby accurately determining the time at which the user pushes the button 20 in the book marker 4 to store the count value into

the memory 26.

If this method is used, it would be unnecessary to provide the display unit 21 for displaying the clock (timer 28) and the time on the book marker 4. Further, if this method is used, it would be unnecessary to correct the timer 28 of the book marker 4.

For example, the count value of the counter of the book marker 4 is measured in the gateway device after a fixed period of time after the book marker 4 is connected to the gateway device 11, thereby enabling application of this method even when the period of the counter of the book marker 4 is unclear.

In the foregoing description, the counter performs its counting operation with a predetermined period of clocks. However, the present invention is not limited to this embodiment, and the counter may be operated with clocks generated at any timing insofar as the count value and the time from the count start time are associated with each other. For example, the counter can be operated with clocks based on M sequence which is generated by using a shift register and an exclusive OR circuit. Alternatively, the period of the clocks may be periodically varied to operate the counter. Of course, the gateway device 11 side is required to know the type of clocks of the counter owned by the book marker 4. Use of these clocks to operate the counter can prevent unjust manufacture or use of the book marker 4.

In the foregoing description, the time at which the button 20 is pushed in the book marker 4 is determined on the gateway device 11. However, the present invention is not limited to this embodiment. For example, in the gateway device 11 are determined time information representing the time at which the button 20 is pushed in the book mark 4, and time information representing the time at which the transmission of the time information from the book marker 4 to the gateway device 11 is carried out. The time information is transmitted to the search engine 10, and the accurate time at which the button 20 is pushed can be determined on the basis of the master clock of the search engine 10.

Next, the content search processing by the system shown in Fig. 2 will be described with reference to the flowchart of Fig. 9. First, in first step S10, the terminal ID 27 of the book marker 4 owned by the user is registered to the book mark search engine 10 according to the procedure as described above.

The user can store the time information by using the book marker 4 having the terminal ID 27 registered therein at any place, for example, on a street or in a car. For example, if the user likes a music piece reproduced from a radio mounted in a car, the user pushes the button 20 of the book marker 4 at that place. The time information when the button 20 is pushed is stored in the memory 26 of the book marker 4 (step S11). A plurality of time information pieces may be stored within the

range of the storage capacity of the memory 26 contained in the book marker 4 (step S12).

In step S13, the book marker 4 and the gateway device 11 (abbreviated as G,D in Fig. 9) are connected to each other. In next step S14, the time information stored in the memory 26 of the book marker 4 is read out together with the terminal ID 27, and transmitted to the gateway device 11 through the above prescribed interface. The processing of the step S14 may be set to be automatically started when the book marker 4 and the gateway device 11 are connected to each other in step S13. In next step S15, the time information and the terminal ID 27 which are transmitted from the book marker 4 to the gateway device 11 are transmitted from the gateway device 11 to the bookmark search engine 10 through the communication line.

In step S16, in the book search engine 10 the information search is carried out on the basis of the time information and the terminal ID transmitted from the gateway device 11. The time information is used as the search condition. For example, if the user wishes to know music piece information, the data base 1 is searched on the basis of the time information, and the title of each music piece broadcasted at each of radio stations at the time represented by the time information is output on the basis of the play list of each broadcast station accumulated in the data base 1.

The search condition is narrowed by using the

registration information of the user at the above step S10 when the search is carried out at the step S16. The search of the data base is carried out on the basis of the terminal ID 27 transmitted from the gateway device 11, and the registration information of the user which is registered as the terminal ID 27 is output. This registration information is further used as the search condition.

For example, when the play list is searched in the data base 1, only the play list of a specific broadcast station is targeted for the search operation by using the broadcast station information input to the "radio station" column 45 when the terminal ID 27 is registered in the book mark search engine 10 in the above step S10.

As described above, when the play list of the targeted broadcast station is searched (step S17), the search result is returned to the user. That is, the search result in the book mark search engine 10 is transmitted to the gateway device 11. In the gateway device 11, the search result transmitted is displayed on the display frame, an example of which is described later, and it is checked whether the information desired by the user is searched or not (step S18).

If any information desired by the user is not contained in the search result, the fact is transmitted from the gateway device 11 to the book mark search engine 10, and in step S19 the search condition is altered to perform the search operation

again. For example, on the basis of the information input to the "post code" column 43 and the "toll call telephone number" column 44, the target of the broadcast station as the search condition is extended to all broadcast stations which can be received within the range defined by these information. The target of the broadcast station as the search condition is not limited to this, and it may be extended to an area adjacent to the area input to the columns 43 and 44.

In the re-searching operation of step S19, the search condition can be automatically set at the book mark search engine 10 side. For example, through the processing of step S10, the registration content registered by the user is stepwise applied to the search condition. The search condition in the re-searching operation may be directly set by the user. A new search condition is input to the gateway device 11 by the user. The search condition thus input is transmitted from the gateway device 11 to the book mark search engine 10.

When the information desired by the user is searched, the searched information is transmitted from the book mark search engine 10 to the gateway device 11 in step S20. For example, in a case where the information of a music piece is searched, the audio data of the music piece searched is transmitted from the book mark search engine 10 to the gateway device 11. The audio data of the music piece may be accumulated in the data base 2. Alternatively, the other site which is mutually

connected through the Internet may be requested to transmit the audio data of a music piece from the other site.

The user can store the audio data thus transmitted into the hard disc 36 of the gateway device 11, for example, and reproduce the audio data by sound processing means 39 and the speaker 90. If the user likes the music piece of the audio data, the user can communicate with the book mark search engine 10 by using the gateway device 11 and requests to purchase an album (CD or the like) in which the music piece is recorded.

Fig. 10 shows an example of the display frame of the gateway device 11 in step S18 and subsequent steps. On the upper portion of the frame are displayed the user name 51, the terminal ID 27 and the area 52 of the registration information of the user. With respect to the area 52, the input column is omitted from the registration frame of Fig. 8 described above. In this case, for example, four broadcast stations of three radio broadcast stations "AAAA", "BBBB" and "CCCC" and one CATV (Cable Television) broadcast station "DDD" are registered.

On the basis of one time information 53 registered in the book marker 4, the search results on the four broadcast stations in the book mark search engine 10 are displayed as displays 54, 55, 56 and 57, respectively. In this case, music pieces are broadcasted at the broadcast stations "AAAA", "BBBB" and "DDD" at the time shown in the time information 53. On the other hand, a commercial is broadcasted at the broadcast station "CCCC".

By exemplifying the display 54 indicating the broadcast station "AAAA", a jacket image 54A of CD in which the music piece broadcasted at the time of the time information 53 by the broadcast station "AAAA" is recorded is displayed below the name of the broadcast station and the frequency band information of the broadcast, the title of the music piece and the name of the singer 54B are displayed below the jacket image 54A, and the selling price 54C of the CD concerned is displayed.

Below the selling price 54C are further disposed buttons 58, 59 and 60 which are common to the respective broadcast stations broadcasting the music pieces and can be virtually operated by a user interface of the gateway device 11. By operating the button 58, the audio data of the music piece concerned are transmitted from the book mark search engine 10 to the gateway device 11, passed through the signal processing of the sound processor 39 and then reproduced by the speaker 90. When the button 58 is operated, the audio data thus transmitted is not stored in a prescribed storage device, for example, the hard disc 36.

The user can select a desired music piece from the music pieces broadcasted from the respective registered broadcast stations on the basis of the jacket image 54A, the title of the music piece, the singer is name 54B and the audio data of the music piece.

The button 59 is used when the user wishes to purchase

the CD in which the music piece concerned is recorded. The button 60 is used when the user wishes to down-load the audio data of the music piece concerned and store the data into the hard disc 36. When the CD is purchased or the music piece is down-loaded by the buttons 59 and 60, the charge is to be paid through a credit card or cash card, for example, on the basis of the number input to the "card No." column 46 of Fig. 8.

In the case of Fig. 10, the buttons 58, 59 and 60 are not displayed for the commercial broadcast of the broadcast station "CCCC", however, a button for subscribe purchase of a displayed article may be provided separately.

When the number of registered broadcast stations is large and thus they cannot be displayed on the frame 50 at a time, information of the other registered broadcast stations can be displayed by operating the button 61.

The foregoing description is made on the assumption that the book marker 4 is a dedicated device for storing the time information, however, it is not limited to this case. For example, it is easy to bring the function of the book marker 4 to portable communication equipment such as a cellular phone, PHS (Personal Handy Phone System) or the like. The button 20 may be disposed together with dial keys or the like in such apparatus to use a telephone number registered in the apparatus as a terminal ID 27. The function of the button 20 may be implemented by a prescribed combination of the dial keys.

Likewise, it is easy to bring the function of the book marker 4 to a receiver of GPS (Global Positioning System). When the function of the book marker 4 is brought to apparatus which is designed to detect the position, the position of the user can be limited, and thus the broadcast stations can be narrowed to perform a more accurate searching operation.

As a modification of the first embodiment, the button 20 may be implemented in a software style in the gateway device 11. For example, the function of the button 20 for storing the time information is allocated to a predetermined key of the gateway device 11 or a predetermined position on the display frame. The function of the button 20 may be allocated to a predetermined icon displayed on the display frame. The time information is stored by operating the icon having the function of the button 20 with a pointing device such as a mouse or the like. The terminal ID 27 is stored in a predetermined area of ROM 32, RAM 33 or the hard disc 36 of the gateway device 11.

When the user operates the icon or the like which is allocated as the button 20 in the gateway device 11, the time information representing the time at which the operation is carried out is stored in a predetermined area of RAM 33 or the hard disc 36. The time information thus stored is read out, and both of the time information and the terminal ID 27 are transmitted to the book mark search engine 10 through the communication line 8. In the book mark search engine 10, the

searching operation is carried out on the basis of the information thus transmitted, and the search result is transmitted from the book mark search engine 10 to the gateway device 11 through the communication line 8.

When the searching operation is carried out in the book mark search engine 10, a unique terminal ID 27 is supplied from each book marker 4 to the book mark search engine 10. Therefore, by using the terminal ID 27, it is known how many persons request and down-load each specific music piece, and it may be used for market research, etc.

Next, a second embodiment of the present invention will be described. In the first embodiment above mentioned, the book marker 4 is designed in such a simple construction that the time information is stored therein by pushing the button 20. In the second embodiment, the book marker 4 is installed in a radio receiver.

Fig. 11 shows an example of the construction of the book marker installed in a radio receiver 70 according to the second embodiment. In Fig. 11, the common parts to the book marker 4 shown in Fig. 5 are represented by the same reference numerals, and the detailed description thereof is omitted. Electric wave received by an antenna 71 is supplied to a tuner 72. In the tuner 72, a predetermined frequency band is selected on the basis of the user's operating to select the broadcast of a desired broadcast station. The signal thus selected is subjected to

predetermined processings such as detection, demodulation and other processing to be converted to an audio signal. The audio signal is supplied to a signal processing circuit 73 to be subjected to amplification processing, etc., and then reproduced by a speaker 74.

On the other hand, the station-selecting information in the tuner 72 is supplied to CPU 25. For example, the frequency band information when a broadcast station is selected is supplied to CPU 25. In CPU 25, the time information is stored in the memory 26 when the button 20 is pushed, and also the station-selecting information thus supplied is stored in the memory 26 in association with the time information thus stored. As in the case of the embodiment shown in Fig. 5, the terminal ID 27 is stored in a predetermined area of the memory 26 in advance. The station-selecting information, the time information and the terminal ID 27 stored in the memory 26 are read out by CPU 25, and output to the outside through the interface 29.

At this time, a table representing the corresponding relationship between the frequency band and the name of the broadcast station which is beforehand created is stored into the memory 26. The frequency band information supplied may be converted to the name of the broadcast station by referring to the table, and stored in the memory 26.

The tuner 72 may be designed so that frequency bands of

plural broadcast stations are set in advance and the frequency bands of these plural broadcast stations are switched at the reception time, which enables the broadcast station name data to be directly supplied from the tuner 72 to CPU 25.

Fig. 12 shows an example of the construction of the search system according to the second embodiment. In Fig. 12, the common parts to the search system of Fig. 2 are represented by the same reference numerals, and the detailed description thereof is omitted. In the radio receiver 70, a broadcast station is selected by the user to select a specific frequency band, and the electric wave broadcasted from the broadcast station 12 is received. A reproduction sound thus received is output from the speaker 74. For example when a favorite music piece is broadcasted, the user pushes the button 20. The time information representing the time at which the button 20 is pushed is stored in the memory 26, and also the station-selecting information of the radio receiver 70 is stored into the memory 26 with being associated with the time information.

The radio receiver 70 and the gateway device 11 are connected to each other by a specific interface. As in the case of the first embodiment, the connection may be performed by using USB, IEEE-1394, RS-232C and IrDA as the interface standards.

As in the case of the embodiment of Fig. 2, software 75 for controlling the communication between the radio receiver

70 and the book mark search engine 10 and the display of the display frame described later is mounted on the gateway device 11. The time information, the station-selecting information and the terminal ID 27 which are stored in the memory 26 of the radio receiver 70 are transmitted from the radio receiver 70 through the specific interface onto the gateway device 11. Further, the time information, the station-selecting information and the terminal ID 27 are supplied from the gateway device 11 through the communication line 8 to the book mark search engine 10.

In the book mark search engine 10, the station-selecting information is used as the search condition together with the time information and the terminal ID 27. Accordingly, in the book mark search engine 10, both of the broadcast time and the selected broadcast station can be specified, so that the searching operation can be performed quickly with higher precision.

The search result is transmitted from the book mark search engine 10 through the communication line 8 onto the gateway device 11 to be subjected to predetermined processing, and then displayed on the display means of the gateway device 11. Fig. 13 shows an example of a search result display on the display means of the gateway device 11. Since the station-selecting information is contained in the search condition, a broadcast received by the radio receiver at any time can be uniquely specified. Accordingly, as shown in Fig. 13, time information

81A, 81B, 81C and 81D and search results 82A, 82B, 82C and 82D are displayed in one-to-one correspondence, respectively. The user can obtain his/her substantially favorite information.

Fig. 14 shows an example of the construction of a search system according to a modification of the second embodiment. In this modification, a radio receiver 100 is provided with the function of the book marker 4 to obtain a reception time and broadcast station information, and also the software 75 mounted in the gateway device 11 is mounted in the radio receiver 100.

In the modification of the second embodiment, as shown in Fig. 14, the radio receiver 100 is provided with the predetermined software 75 and the memory 26 in which the time information, the broadcast station information and the terminal ID (not shown) are stored. The processing of this system is substantially the same as the processing of the first embodiment described with reference to Fig. 9.

That is, the user receives a radio broadcast from a broadcast station 12 through the radio receiver 100, and reproduces the broadcast thus received through a speaker 111. The user listens to the reproduced sound, and pushes the button 20 if the user likes a music piece being broadcasted. When the button 20 is pushed, the time information representing the time at which the button 20 is pushed and the broadcast station information such as the frequency band of the broadcast received, etc. are stored into the memory 26 in the radio receiver 100.

The radio receiver 100 and the book marker search engine 10 are connected to each other through a specific communication line 8 such as the Internet or the like. By the communication through the communication line 8, the time information, the broadcast station information and the terminal ID 27 stored in the memory 26 of the radio receiver 100 are transmitted to the book mark search engine 10. In the book mark search engine 10, the information searching operation is carried out on the basis of the time information, the broadcast station information and the terminal ID 27 thus transmitted and the search result is transmitted to the radio receiver 100 through the communication line 8. In the radio receiver 100, the search result thus transmitted is displayed as a display frame similar to that of Fig. 13 on the display means (not shown). The user can down-load audio data or request to purchase an article through the communication line 8 by carrying out an operation based on the display frame.

The radio receiver 100 according to the modification of the second embodiment may be designed in the same construction as the radio receiver 70 of the above-described second embodiment. In this case, the communication between the radio receiver 70 and the book mark search engine 10 is carried out by using the interface 29. The search result of the book mark search engine 10 is easily displayed on the display unit 21. A response to the search result displayed on the display unit

21 can be transmitted to the book mark search engine 10 by using input means (not shown).

One example being shown in Fig. 15, the radio receiver 100 may be designed by adding a general personal computer with a tuner unit 109 which is designed to receive radio broadcasts. The tuner unit 109 selects the frequency band of a desired broadcast station from the electric wave received by the antenna 114, performs predetermined processing such as detection of station-selected electric wave, demodulation, etc. and then outputs an audio signal. The audio signal output from the tuner unit 109 is amplified by an amplifier 110, for example, and then reproduced by a speaker 111.

The tuner unit 109 is connected to a bus 112. The station-selecting information, etc. at the tuner unit 109 are supplied through a bus 112 to CPU 101, etc. as described later.

CPU 101, ROM 102 and RAM 103 are connected to the bus 102. In ROM 102 are beforehand stored the terminal ID 27 and a predetermined program. In RAM 103 are stored time information representing the push time of the button 20 and broadcast station information supplied from the tuner unit 109 through the bus 112.

A display control circuit 104, a storage medium 106, an input interface 107 and a communication interface 108 are further connected to the bus 112. The display control circuit 104 is connected to a display 105 comprising LCD to drive the

display 105 on the basis of a display control signal supplied from CPU 101 through the bus 112, thereby performing a specific display operation. The storage medium 106 is an auxiliary storage medium in which predetermined data and programs are stored, and it may comprise a semiconductor memory or a hard disc. However, it is not limited to these elements, and something which is freely detachably mounted in the storage medium 106 may be used. The communication means 108 comprises a modem, for example, and controls the communication in the communication line 8.

The input interface 107 serves as an interface between a prescribed input device and CPU 101. A keyboard 113 and a pointing device such as a pad device or the like (not shown) are connected to the input interface 107, and the button 20 is also connected to the input interface 107. The display 105 may be designed to have a touch panel structure to supply the output of the touch panel to the input interface 107. The communication interface 108 serves as an interface with the book mark search engine 10, which comprises the Internet.

Further, in the above system, the time information and the broadcast station information stored in the memory 26 of the book marker 26 are output through the interface 29 to the gateway device 11 or the book mark search engine 10 which is located at the outside. However, the present invention is not limited to this embodiment. For example, the book marker 4 may

be provided with communication means for communicating with another book marker 4' to transmit the time information and the broadcast station information stored in the memory of the book marker 4 to a book marker 4' of another user. The transmission of the time information and the broadcast station information to the other book marker 4' enables the user of the book marker 4' receiving these information to search a content on the basis of the information obtained by another person.

A communication based on infrared ray signals such as IrDA, a communication based on electric wave or a communication based on the direct connection between the book markers 4 and 4' through a connector and a cable, etc. may be considered as the communication means between the book marker 4 and the book marker 4'. When the book marker 4 and the book marker 4' are directly connected to each other, a specific interface is provided to each of the book markers 4 and 4', whereby the communication can be performed by using USB, IEEE-1394, RS-232C or the like. Further, the communication method is not limited to the above styles, and the communication between the book markers 4 and 4' can be performed by using other wire or wireless (radio) communication methods.

Further, according to the present invention, the book marker 4 is required to display or store an accurate time. For example, the book marker 4 is provided with reception means for receiving standard electric wave on which accurate time

information is superposed, and adapted to receive the electric wave periodically. The timer 28 is corrected on the basis of the time information superposed on the electric wave thus received, whereby the accurate time information can be obtained at all times.

In Japan, for example, standard time electric wave (JG2AS) may be used as the standard electric wave on which the accurate time is superposed. Further, a time casting of television broadcast or radio broadcast may be used as the standard electric wave.

The book marker 4 may be provided with a function of detecting minute electric wave corresponding to a reception frequency which occurs in a radio receiver or television receiver. The electric wave thus detected is an electric wave based on a signal generated in a local oscillation circuit of the receiver, for example. When a user watches the television broadcast or listens to the radio broadcast and likes a music piece in the broadcast, the user pushes the button 20 of a book marker 4'' having the minute electric wave detection function in the neighborhood of the television receiver or radio receiver. In a detection circuit of the book marker 4'', the electric wave occurring in the television receiver or radio receiver is detected, the frequency of the electric wave thus detected is determined, and the frequency information thus obtained is stored into the memory 20 together with the time information

representing the time at which the button 20 is pushed.

Fig. 16 shows a construction example of the detection circuit of the book marker 4''. The electric wave received by an antenna 150 is supplied to tuners 151A, 151B and 151C which are designed to selectively receive the electric waves of specific broadcast stations respectively. The outputs of the tuners 150A, 150B and 150C are detected by detection circuits 152A, 152B and 152C respectively, and then supplied to a maximum value detection circuit 153. The maximum value detection circuit 153 is constructed by a differential circuit as shown in Fig. 16, and outputs an output signal from only the channel corresponding to the signal having the maximum level among plural signals input. The output of the maximum value detection circuit 153 is supplied to a latch circuit 154. When a button 20' interlocking with the button 20 is switched ON, the latch circuit 154 latches the output of the maximum value detection circuit 153, and outputs the output signal corresponding to the channel from which the signal is output. The output signal is decoded by CPU 25 to be converted to broadcast station information, and then stored into the memory 26 together with the time information representing the time at which the button 20 is pushed.

The book marker 4 of the present invention may be used in combination with GPS (Global Positioning System). For example, a built-in GPS is provided in the book marker 4, and

latitude and longitude information at the time when the button 20 is pushed is stored into the memory 26 with being associated with the time information. The latitude and longitude information thus stored and the time information are afterwards transmitted to the gateway device 11.

For example, in a broad country like the United State of America whose territory is wide in the west-and-east direction, plural time zones exist in the county. In the gateway device 11, the time information can be corrected according to the time zone on the basis of the latitude and longitude information thus transmitted, thereby performing the search of the content on the basis of the accurate time information at all times.

The area in which the user resides can be specified by using the latitude and longitude information obtained by GPS, and thus the specification of the radio station can be performed more precisely.

Further, the user pushes the button 20 while walking or on a moving route, at a stop-at place or in a shop. The user afterwards transmits the latitude and longitude information to and the time information to the gateway device 11. If the gateway device 11 is beforehand provided with an application for plotting on a map in accordance with the time information and the latitude and longitude information, the user can know a schematic route along which the user passed, or what time and at which store the user stopped on that day. Providing a data

base comprising shop information in the search engine 10 makes it possible to obtain detailed information on shops at which the user stops.

As described above, according to the present invention, by pushing the button provided to the book marker, the time at which the button is pushed is stored as time information into the book marker. On the other hand, the book mark search engine comprises a data base in which a play list containing the broadcast content of each broadcast station and the broadcast time of the content in associated with each other is accumulated, and another data base in which the content and the content-relevant information are accumulated in association with each other. Therefore, there is an effect that even when the user accidentally likes a content, the user merely operates the button of the book marker to store the time information of the time, whereby the user can afterward search the broadcasted content from the book mark search engine without making any note.

Further, according to the present invention, a content broadcasted from a radio or the like can be afterward searched by merely pushing the button of the book marker and storing the time information representing the time. Therefore, there is an effect that the user can easily know the information on the content, and thus the user can easily purchase an article relevant to the content.

Still further, according to the present invention, the search of the content is performed on the basis of only the time information which is stored with the book marker by the user. Therefore, there is an effect that it is unnecessary to transmit information other than the content itself from the broadcast station side which supplies the content, and thus the broadcast station side suffers little load.

There is an effect that the present invention is applicable regardless of whether the broadcast mode is an analog mode or a digital mode.

Further, according to the present invention, there is an effect that the reception side merely stores the time information to obtain desired information and thus suffers extremely little load.

Still further, according to the present invention, in the search operation of the content, the terminal ID inherent to each book marker is transmitted to the book mark search engine together with the time information. Therefore, there is an effect that it can be easily known how many persons requested and purchased each specific content.

CLAIMS:

1. A search system for searching related information associated with a broadcast content, comprising:

a communication apparatus comprising,

a operation unit;

a counter; and

a communication unit configured to transmit a count value by said counter to a search apparatus, said count value being used for generating a differential time between an operate time of said operation unit and a transmitting time of said count value,

the search apparatus comprising,

a timer configured to output a current time;

a storage device configured to store related information associated with said broadcast content and a broadcast time of said broadcast content;

a differential time generator configured to generate said differential time according to said count value transmitted from said communication unit;

a operate time calculator configured to calculate said operate time of said operation unit according to said current time from said timer and said differential time generated by said differential time generator; and

a search unit configured to search related information of said broadcast content broadcasted on said operate time from said storage device based on said operate time calculated by said operate time calculator.

2. The search system as claimed in claim 1, wherein said search apparatus comprises a gateway device and a search device,

said gateway device comprising:

said timer;

said differential time generator; and

said operate time calculator,

said search device comprising:

said storage device; and

said search unit.

3. The search system as claimed in claim 1, wherein said search apparatus comprises a storage medium configured to store desired broadcast station information associated with a user identification information,

said communication unit transmits said user identification information with said count value,

said search unit searches desired broadcast station information from said storage medium based on said user

identification information transmitted from said communication unit, and searches related information of said broadcast content broadcasted on said operate time and a broadcast station associated with said desired broadcast station information.

4. The search system as claimed in claim 1, wherein said search apparatus comprises a storage medium configured to store a zip code associated with a user identification information,

said communication unit transmits said user identification information with said count value,

said search unit searches said zip code from said storage medium based on said user identification information transmitted from said communication unit, and searches related information of said broadcast content broadcasted on said operate time and a broadcast station associated with said zip code.

5. The search system as claimed in claim 1, wherein said search unit searches title information of music broadcasted on said operate time.

6. A communication apparatus configured to transmit information used for calculating a broadcast time to a search apparatus having a storage device configured to store related information

associated with a broadcast content and a broadcast time of said broadcast content, said search apparatus being configured to search related information of said broadcast content based on a broadcast time from said storage device, comprising:

a operation unit;

a counter; and

a communication unit configured to transmit a count value by said counter to a search apparatus, said count value being used for calculating a differential time between an operate time of said operation unit and a transmitting time of said count value,

wherein said search apparatus calculates said broadcast time based on said count value.

7. A search apparatus for searching related information associated with a broadcast content, comprising:

a timer configured to output a current time;

a storage device configured to store related information associated with said broadcast content and a broadcast time of said broadcast content;

a differential time generator configured to generate a differential time between an operate time of a operation unit of a communication apparatus and a transmitting time of a count value according to said count value transmitted from said communication

apparatus including a counter;

a operate time calculator configured to calculate said operate time of said operation unit according to said current time from said timer and said differential time generated by said differential time generator; and

a search unit configured to search related information of said broadcast content broadcasted on said operate time from said storage device based on said operate time calculated by said operate time calculator.

8. The search apparatus as claimed in claim 7, wherein said search apparatus comprises a storage medium configured to store desired broadcast station information associated with a user identification information,

said search unit searches desired broadcast station information from said storage medium based on said user identification information transmitted from said communication apparatus, and searches related information of said broadcast content broadcasted on said operate time and a broadcast station associated with said desired broadcast station information.

9. The search apparatus as claimed in claim 7, wherein said search apparatus comprises a storage medium configured to store a zip code

associated with a user identification information,

said search unit searches said zip code from said storage medium based on said user identification information transmitted from said communication apparatus, and searches related information of said broadcast content broadcasted on said operate time and a broadcast station associated with said zip code.

10. The search apparatus as claimed in claim 7, wherein said search unit searches title information of music broadcasted on said operate time.

11. A search system for searching related information associated with a broadcast content, comprising:

a communication apparatus comprising:

a operation unit; and

a communication unit configured to transmit request information for requesting to search said related information to a search apparatus after a operate time of said operation unit, the search apparatus comprising:

a timer configured to output a current time;

a storage device configured to store related information associated with said broadcast content and a broadcast time of said broadcast content;

a operate time calculator configured to calculate said operate time of said operation unit by going back to a predetermined time from a transmitting time of said request information from said communication unit;

a search unit configured to search related information of said broadcast content broadcasted on said operate time from said storage device based on said operate time calculated by said operate time calculator.

12. The search system as claimed in claim 11, wherein said communication apparatus comprises a database storing a plurality of music data, said communication apparatus comprises recording unit configured to record said music data onto a recording medium,

said communication unit receives related information searched by said search unit,

said communication unit transmits request information for requesting a download of music data associated with said related information to said search apparatus according to an input from said operation unit,

said search unit searches music data associated with said request information from said database and transmits said searched music data to said communication apparatus, and

said recording unit records said music data received via said communication unit to a recording medium.

13. The search system as claimed in claim 11, wherein said communication apparatus comprises a broadcast station setting unit configured to set broadcast station information,

said communication unit transmits said broadcast station information to said search apparatus, and

said search unit searches related information of said broadcast content broadcasted on said operate time and a broadcast station associated with said transmitted broadcast station information.

14. The search system as claimed in claim 11, wherein said communication apparatus is accommodated with a wireless communication module in a portable housing.

15. The search system as claimed in claim 14, wherein said communication apparatus is accommodated with a mobile phone module in a portable housing.

16. The search system as claimed in claim 11, wherein said communication apparatus comprising:

receiving unit configured to receive a broadcast signal broadcasted

on a broadcast station tuned in based on an operation for said operation unit; and

reproducing unit configured to receive a broadcast signal outputted from said receiving unit,

said communication unit transmits broadcast station information indicating said tuned broadcast station to said search apparatus, and said search unit searches related information of said broadcast content broadcasted on said operate time and a broadcast station associated with said transmitted broadcast station information.

17. The search system as claimed in claim 16, wherein said receiving unit comprises a television tuner.

18. The search system as claimed in claim 16, wherein said receiving unit comprises a radio tuner.

19. A communication apparatus configured to transmit information used for calculating a broadcast time to a search apparatus having a storage device configured to store related information associated with a broadcast content and a broadcast time of said broadcast content, said search apparatus being configured to search related information of said broadcast content based on a broadcast

time from said storage device, comprising:

a operation unit;

a receiving unit configured to receive a broadcast signal broadcasted on a broadcast station tuned in based on an operation for said operation unit;

a reproducing unit configured to receive a broadcast signal outputted from said receiving unit;

a communication unit configured to transmit request information for requesting to search said related information and broadcast station information indicating said tuned broadcast station; and

wherein said communication apparatus comprises recording unit configured to record said music data onto a recording medium,

said communication unit receives related information transmitted from

said search apparatus,

said communication unit transmits request information for requesting a download of music data associated with said related information to said search apparatus according to an input from said operation unit.

20. The communication apparatus as claimed in claim 19, wherein said communication apparatus is accommodated with a wireless communication module in a portable housing.

21. The communication apparatus as claimed in claim 20, wherein said communication apparatus is accommodated with a mobile phone module in a portable housing.

22. The communication apparatus as claimed in claim 19, wherein said receiving unit comprises a television tuner.

23. The search system as claimed in claim 19, wherein said receiving unit comprises a radio tuner.

24. A search apparatus for searching related information associated with a broadcast content, comprising:

a timer configured to output a current time;

a storage device configured to store related information associated with said broadcast content and a broadcast time of said broadcast content;

a operate time calculator configured to calculate an operate time of said operation unit by going back to a predetermined time from a transmitting time of a request information for requesting to search

related information from said communication apparatus including said operation unit;.

a search unit configured to search related information of said broadcast content broadcasted on said operate time from said storage device based on said operate time calculated by said operate time calculator.

25. The search apparatus as claimed in claim 24, wherein said communication apparatus comprises a database storing a plurality of music data,

said search unit searches music data associated with request information for requesting a download of music data associated with said related information from said communication apparatus from said database and transmits said searched music data to said communication apparatus.

26. The search apparatus as claimed in claim 24, wherein said search unit searches related information of said broadcast content broadcasted on said operate time and a broadcast station associated with broadcast station information transmitted from said communication apparatus.