TITLE OF THE INVENTION

Multiplex Broadcasting Method and Apparatus

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to a receiving apparatus capable of receiving both position detection data and character data and a transmitting apparatus for transmitting the information to the receiving apparatus.

Description of the Related Art

In television or radio broadcasting, a retail store or a dealer can put an advertisement. However, since the contents of the advertisement on air are directed to the entire broad area covering the broadcasting reception area, the cost necessary for putting such advertisement is increased such that only major dealers can utilize the broadcasting for advertisement.

Thus a system has been conceived in which an advertising party purchases the right for one picture of data broadcasting employing digital signals in order to furnish the information to the consumer.

With such system, the cost sustained by the advertiser is limited to that for only one picture, so that the system can be exploited even by a small retail shop. There is an additional merit that the information differing from day to day can be furnished. Each retail store putting an advertisement formulates ad data based on the ad using a simplified picture formulating software and sends

the ad data to a data broadcasting company by a communication system employing a modem. The data broadcasting company collects and packs the ad data and transfers the packed ad data to a broadcasting station to furnish the ad data in a package to end consumers.

In the above system of furnishing the information using data broadcasting by the above digital signals, since a large volume of text data (still picture data) are supplied by the retail stores, a large number of a wide variety of still picture data are collected by the data broadcasting company. Thus the information received by the consumer becomes voluminous.

The end consumers can construct a search system of transiently storing the received data in a recording medium and reproducing the recording medium for search in order to receive a service similar to that offered by a leaflet inserted into a newspaper.

However, since a majority of the voluminous data is not required, while there is no simplified method for selecting the information, the consumer receiving the data is bothered with the search operation. The result is that this sort of services has not been offered to end consumers.

The present Assignee has proposed a method and an apparatus disclosed in JP Patent Kokai JP-A-7-154350.

With the method and apparatus for multiplex broadcasting, a territory-based type commercial in multiplex broadcasting is transmitted, using the telephone number or the mail number as the

territorial code, and the receiving side selects a pre-set territorial code in order to display the commercial.

The above method has, however, a drawback that the territorial code is uniquely defined and hence the territory cannot be selected freely.

SUMMARY OF THE INVENTION

It is therefore a primary object of the present invention to provide a method and an apparatus for multiplex broadcasting wherein the information on the latitude and longitude or the information on the appellation for the territory is used as position detection data for affording a degree of freedom to territory selection.

It is another object of the present invention to provide a method and an apparatus for multiplex broadcasting wherein the information on the appellation for the territory is used as the position detection data for affording the degree of freedom in selecting the territory.

In one aspect, the present invention provides a method for multiplex broadcasting in which the auxiliary broadcasting information corresponding to character data encoded by a broadcasting station is multiplexed on the main broadcasting information and broadcast, and in which the encoded auxiliary information received by the receiving side is decoded by the receiving side and outputted along with the main broadcasting information, wherein the broadcasting station accords the

latitude/longitude information to the auxiliary broadcasting information, encodes the resulting information and multiplexes the encoded information to the main broadcasting information. The receiving side outputs the decoded auxiliary broadcasting information when the latitude/longitude information as set on the receiving side coincides with the decoded latitude/longitude information.

In another aspect, the present invention provides a method for multiplex broadcasting in which the auxiliary broadcasting information corresponding to character data encoded by a broadcasting station is multiplexed on the main broadcasting information and broadcast, and in which the encoded auxiliary information received by the receiving side is decoded by the receiving side and outputted along with the main broadcasting information, wherein the broadcasting station accords the territory appellation information to the auxiliary broadcasting information, encodes the resulting information and multiplexes the encoded information to the main broadcasting information. The receiving side outputs the decoded auxiliary broadcasting information when the territory appellation information as set on the receiving side coincides with the decoded territory appellation information.

In still another aspect, the present invention provides an apparatus for receiving the multiplex broadcasting having reception means for receiving the multiplexed broadcasting information, separation means for separating the encoded auxiliary information

from the received multiplexed broadcasting information, and decoding means for decoding the separated encoded auxiliary information, including storage means for storing the latitude/longitude information and comparison means for comparing the latitude/longitude information stored in the storage means to the latitude/longitude information contained in the auxiliary information decoded by the decoding means. The auxiliary information is outputted under control by an output of the comparison means when the latitude/longitude information in the storage means coincides with the latitude/longitude information contained in the auxiliary broadcasting information.

In yet another aspect, the present invention provides an apparatus for receiving the multiplex broadcasting having reception means for receiving the multiplexed broadcasting information, separation means for separating the encoded auxiliary information from the received multiplexed broadcasting information, and decoding means for decoding the separated encoded auxiliary information, including storage means for storing the territory appellation information and comparison means for comparing the territory appellation information stored in the storage means to the territory appellation information contained in the auxiliary information. The auxiliary information is outputted under control by an output of the comparison means when the territory appellation information in the storage means coincides with the territory appellation information contained in the auxiliary broadcasting

information. With the above-described reception apparatus according to the present invention, the user receiving the transmission information made up of the character data and the position detection data needs only to enter the ID information and position data specifying the desired territory for taking out desired data easily to improve the search efficiency. The information purveyor needs only to lease broadcasting in terms of a picture lasting for one second or less, instead of leasing the broadcasting in terms of the broadcasting time, thus lowering the leasing charges and relieving excessive costs otherwise incurred to the information purveyor.

With the transmission apparatus according to the resent invention, position detection data specifying the site of purveying character data of the information is annexed to the transmission information for facilitating the information search operation by the information purveyor.

In addition, since the transmission information is compressed before transmission, the information purveyor may be relieved of excessive costs.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig.1 is a block diagram showing an illustrative structure of a receiving apparatus according to the present invention.

Fig.2 shows an example of the information received by the receiving apparatus.

Fig.3 is a flowchart for illustrating the CPU operation at the

time of information searching by the receiving apparatus.

Fig.4 illustrates an example of a screen displayed on a display unit of the receiving apparatus.

Fig.5 is a block diagram showing an illustrative structure of a transmitting apparatus according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, preferred embodiments of a receiving apparatus and a transmitting apparatus according to the present invention will be examined in detail.

Fig.1 shows a receiving apparatus according to the present invention capable of receiving position detection data and character data. The receiving apparatus includes a CPU 4 for comparing position data entered by the user and transmitted position detection data and for searching pertinent character data from the received data responsive to the results of comparison.

The position detection data may be at least one of the latitude/longitude information and the territory name or appellation.

The reception apparatus may also include a display unit for displaying a map based on the transmitted position detection data.

With the present receiving apparatus, data derived from signals seized by a antenna 8 is stored in a memory 5. This data is made up of position detection data and character data. The position detection data is at least one of the latitude/longitude information and the name or appellation of the territory. The user

enters via a key input unit 6 at least one of the latitude/longitude information and the appellation of the territory in addition to the ID information specifying the category of the desired information. The position data and the ID information are sent to the CPU 4.

The CPU 4 detects, from among the position detection data stored in the memory 5 and having the ID information coincident with the entered ID information, the position detection data coincident with the position data.

The CPU 4 searches and takes out character data associated with the detected position detection data. The character data thus taken out is sent to a decoder 2. A display unit 7 makes a display derived from the character data.

Fig.2 shows an example of such character data.

Referring to Fig.2, the transmission information 11 is made up of a header portion 21, a data portion 22 and a search data portion 23.

The header portion 21 corresponds to line 1 of the transmission information 11. The header portion specifies that the program is on air on February 23, 1995 by a certain and certain broadcasting company under the sponsorship of a certain and certain real-property company, and also that the transmission information corresponds to page 6 of an 8-page terrain ad of a program having an allocated identification number 13 (program 13). This sort of ad has a capacity of approximately 5 kbytes and hence can be

transmitted in approximately one second.

The data portion 23 states the information of an object of the real property made up of, for example, seven rows of characters. The number of rows of the character string is determined by the information contents.

The search data portion 23 corresponds to the last line, that is the ninth line, of the transmission information, and is made up of the ID information for identifying the data category, latitude/longitude information as position detection data and the area information specifying an area for which the information is furnished. For example, the first six digits of "JO1234" is the ID information, the next following digits of "NO351234" and "E1351234" specify the latitude/longitude information, and the last five digits of "00009" is the area information. The latitude/longitude information specifies "35· 12'34'' north latitude and 135· 12'34'' east longitude.

The last one line for the search data portion 23 may be hidden from the consumer. Fig.2 shows an example of the information on the real property as the ID information only by way of illustration. That is, the ID information may also be that for the bargaining information for foodstuffs or apparel, bus timetables, holidays for retail stores or emergency medical organizations. Although the position detection data in the above character string is the latitude /longitude information, at least one of data capable of identifying the territory, such as mail number, telephone number,

appellation for the territory or the coded appellation for the territory, may also be employed.

Since the above information can be transmitted in approximately one second, the information purveyor may be relieved of excessive costs. In addition, the broadcasting station can contract with, for example, 3,600 companies for one-hour broadcasting. Thus, if the transmission fee of the order of \10,000 is collected per week, an income of \140,000,000 per month may be realized by leasing the broadcasting time of one hour for a period of one month.

In the above receiving apparatus, the RF reception unit 1 receives electro-magnetic waves seized by the antenna 8 and converts it into RF signals. The decoder 2 decodes the RF signals by a pre-set code and sends the decoded signal to the CPU 4.

The operation of the CPU 4 is now explained by referring to a flowchart of Fig.3. It is assumed that the consumer desires to obtain the information near his or her own premises.

At step S1, data decoded by the decoder 2, such as data shown in Fig.2, is sent to the CPU 4. The CPU 4 then proceeds to step S2, where ID information corresponding to the eighth line from the top excluding the header portion, latitude/longitude information and the area information in Fig.2, are separated. The CPU 4 then proceeds to step S4.

At step S5, the consumer enters on the key entry unit 6 his or her position data, such as the latitude information, and the ID

number specifying the desired category. The CPU 4 then proceeds to step S6 where the position data and the ID number are stored in the memory 5. The CPU 4 then proceeds to step S4.

At step S4, the position detection data of data having the ID number coincident with the ID number is taken out and compared to the position data. The CPU 4 then proceeds to step S7 where it is judged whether or not the two data coincide with each other. If the result of judgment at step S7 is NO, that is if the position detection data is not coincident with the position data, further data processing is discontinued. The CPU 4 then reverts to step S1.

If the result of decision at step S7 is YES, that is if the position detection data is coincident with the position data, the CPU 4 proceeds to step S8 where the character data corresponding to the character data is searched and sent to the memory 5 where the data is stored.

Since the flowchart shows an example of searching for information near the premises of the user, all of data in a range of 10 km, which is a pre-set range, near the premises of the user, are taken out as character data corresponding to the position detection data. The above range of 10 km is a pre-set default value and hence may be optionally modified by the user.

At step S9, data held in the memory 5 is displayed on a display unit 7, as will be explained later. After such display, the CPU 4 reverts to step S1 to repeat the same sequence of operations as that described above, as long as data reception is continued.

Although Fig.3 shows an example of taking out the information near the premises of the user, the information in an optional territory may be taken out by a similar sequence of operations. In this case, however, it is not the position data near the premises of the user but the position data of an optional territory that is to be entered at step S5 by the user.

Returning to Fig.1, a display data processor 3 formulates map data based on the position detection data sent from the CPU 4 via the decoder 2 and outputs the resulting map data to the display unit 7. The display unit then displays the map based on the map data.

Although the memory 5 may be a semiconductor memory, a driver capable of loading a disc-shaped recording medium thereon may also be provided and the information may then be stored in the disc-shaped recording medium so as to be taken out whenever the user desires to view the stored information. Since a general-purpose disc may be used at this time as the recording medium, an information supplying system having a high search efficiency may be provided without imposing excess load on the consumer.

An indicating lamp, such as an LED lamp, may be provided for indicating to the user whether or not reception of essential data has come to a close.

Fig.4 shows an example of the display screen on the display unit 7.

In Fig.4, a map image 13 is displayed on a display 12 of the

display unit 7. In the map image 13, the position denoted by, for example, the latitude/longitude information of the position detection data, is indicated by a point 14.

A transmission device for transmitting data received by the receiver unit has an encoding unit 31 for encoding character data processed for data transmission and position-detection data having the latitude/longitude information corresponding to the contents of the character data in accordance with a pre-set code, a transmission unit 32 for modulating the data encoded by the encoding unit 31 for conversion to radio signals and an antenna 33 over which to output radio signals thus converted by the transmission unit 32, as shown in Fig.5.

As the position detection data, the area information specifying an area for which the information is furnished is annexed for indicating for which area centered about the point specified by the latitude/longitude information the information is furnished. Other position detection data capable of specifying the particular site, such as the appellation of an territory or the coded appellation of the territory may be annexed as the position detection data.

If the ID information as the category information specifying the category of the contents of transmission is annexed and transmitted as the character data, the receiving side can use the ID information when searching for the desired information for improving the searching efficiency.

The encoding unit 31 encodes the character data and the position detection data by a pre-set code and further compresses the encoded data to output the resulting data as the transmission information to the transmission unit 32.

By compressing and subsequently transmitting the information in this manner, the broadcasting time occupied by the information purveying side may be shortened for reducing the expenses otherwise incurred to the information purveying side.

CLAIMS

Claim 1. A method for multiplex broadcasting in which the auxiliary broadcasting information corresponding to character data encoded by a broadcasting station is multiplexed on the main broadcasting information and broadcast, and in which the encoded auxiliary information received by the receiving side is decoded by the receiving side and outputted along with the main broadcasting information, wherein the improvement resides in that t h e broadcasting station accords the latitude/longitude information to the auxiliary broadcasting information, encodes the resulting information and multiplexes the encoded information to the main broadcasting information, and in that

the receiving side outputs the decoded auxiliary broadcasting information when the latitude/longitude information as set on the receiving side coincides with the decoded latitude/longitude information.

Claim 2. A method for multiplex broadcasting in which the auxiliary broadcasting information corresponding to character data encoded by a broadcasting station is multiplexed on the main broadcasting information and broadcast, and in which the encoded auxiliary information received by the receiving side is decoded by the receiving side and outputted along with the main broadcasting information, wherein the improvement resides in that t h e broadcasting station accords the territory appellation information to the auxiliary broadcasting information, encodes the resulting

information and multiplexes the encoded information to the main broadcasting information, and in that

the receiving side outputs the decoded auxiliary broadcasting information when the territory appellation information as set on the receiving side coincides with the decoded territory appellation information.

Claim 3. An apparatus for multiplex broadcasting comprising encoding means for encoding the auxiliary broadcasting information, multiplexing means for multiplexing an output of the encoding means to the main broadcasting information and transmission means for transmitting the information multiplexed by said multiplexing means, wherein the improvement resides in according the latitude/longitude information to said auxiliary broadcasting information and encoding the resulting information by said encoding means.

Claim 4. An apparatus for multiplex broadcasting comprising encoding means for encoding the auxiliary broadcasting information, multiplexing means for multiplexing an output of the encoding means to the main broadcasting information and transmission means for transmitting the information multiplexed by said multiplexing means, wherein the improvement resides in according the territory appellation information to said auxiliary broadcasting information and encoding the resulting information by said encoding means.

Claim 5. An apparatus for receiving the multiplex broadcasting

having reception means for receiving the multiplexed broadcasting information, separation means for separating the encoded auxiliary information from the received multiplexed broadcasting information, and decoding means for decoding the separated encoded auxiliary information, comprising:

storage means for storing the latitude/longitude information; and

comparison means for comparing the latitude/longitude information stored in said storage means to the latitude/longitude information contained in the auxiliary information decoded by said decoding means; wherein

said auxiliary information is outputted under control by an output of said comparison means when the latitude/longitude information in said storage means coincides with the latitude/longitude information contained in said auxiliary broadcasting information.

Claim 6. An apparatus for receiving the multiplex broadcasting having reception means for receiving the multiplexed broadcasting information, separation means for separating the encoded auxiliary information from the received multiplexed broadcasting information, and decoding means for decoding the separated encoded auxiliary information, comprising:

storage means for storing the territory appellation information; and

comparison means for comparing the territory appellation

information stored in said storage means to the territory appellation information contained in the auxiliary information; wherein

said auxiliary information is outputted under control by an output of said comparison means when the territory appellation information in said storage means coincides with the territory appellation information contained in said auxiliary broadcasting information.

Claim 7. The apparatus for receiving the multiplex broadcasting as claimed in claim 5 wherein the auxiliary broadcasting information is made up of the ID information for category identification, latitude/longitude information and character data.

Claim 8. The apparatus for receiving the multiplex broadcasting as claimed in claim 6 wherein the auxiliary broadcasting information is made up of the ID information for category identification, the territory appellation information and character data.