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"BROADCASTING DEVICE AND RECEIVING DEVICE"

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION:

5 The present invention relates to a broadcasting device and a receiving device, particularly to a broadcasting device and a receiving device used in a system where information to be transmitted from the broadcasting device is stored in the receiving device.

10 2. DESCRIPTION OF THE RELATED ART:

 In a system where information to be transmitted from a broadcasting device is stored in a receiving device, the information to be stored is selected on the receiving device side. For example, in data broadcasting, a predetermined
15 keyword is set on the receiving device side, and based on the set keyword, the receiving device selects a part of the information transmitted from the transmitting device and stores this part in a storage management section.

20 It is desired to implement a system in which it is possible to transmit information, such as direct mail, from a broadcasting device to the receivers of members based on a member list.

25 However, with the conventional system described above, the broadcasting device cannot transmit the data to particular receivers because the data to be stored therein is selected on the receiving device side.

30 When information such as direct mail is transmitted from a broadcasting device to receiving devices, it is necessary to ensure the confidentiality of information, such as a member list.

SUMMARY OF THE INVENTION

5 According to one aspect of this invention, there is provided a broadcasting device for broadcasting a program with one or more receiving terminal identifiers attached thereto for identifying a receiving terminal.

10 In one embodiment of the invention, the receiving terminal identifiers have been converted into a predetermined form.

15 In one embodiment of the invention, the predetermined form is provided by using a one-way function.

20 In one embodiment of the invention, the broadcasting device broadcasts a program with one or more group identifiers, which identify a plurality of the receiving terminals as a group, attached thereto.

In one embodiment of the invention, each of the receiving terminal identifiers is a telephone number.

25 In one embodiment of the invention, each of the group identifiers is the whole or part of a zip code.

30 In one embodiment of the invention, each of the group identifiers is an area code or an area code plus a local area code of the telephone number.

According to another aspect of this invention, there is provided a receiving device, comprising: a receiving section for receiving a program with one or more receiving

terminal identifiers attached thereto; an identifier storage section for storing an associated receiving terminal identifier; a storage management section for storing and managing the program; a separating section for separating the program with the receiving terminal identifiers attached thereto which has been received by the receiving section into the receiving terminal identifiers and the program; a determination section for determining whether the one or more receiving terminal identifiers separated by the separating section include the associated receiving terminal identifier stored in the identifier storage section; and a storage control section for storing the program separated by the separating section in the storage management section when the determination section determines that one of the one or more receiving terminal identifiers include the associated receiving terminal identifier.

In one embodiment of the invention, the receiving terminal identifiers have been converted into a predetermined form.

In one embodiment of the invention, the predetermined form is provided by using a one-way function.

In one embodiment of the invention, the receiving section receives a program with one or more group identifiers attached thereto; the identifier storage section stores an associated group identifier; the separating section separates the program with the one or more group identifiers attached thereto which has been received by the receiving section into the group identifiers and the program; and the determination section determines whether the one or more

group identifiers separated by the separating section include the associated group identifier stored in the identifier storage section.

5 In one embodiment of the invention, each of the receiving terminal identifiers is a telephone number.

 In one embodiment of the invention, of the group identifiers is the whole or part of a zip code.

10 In one embodiment of the invention, each of the group identifiers is an area code or an area code plus a local area code of a telephone number.

15 Thus, the invention described herein makes possible the advantages of (1) providing a broadcasting device and a receiving device in which it is possible to transmit the information from the broadcasting device to a particular receiving device, and (2) providing a broadcasting device
20 and a receiving device in which it is possible to ensure confidentiality of information transmitted from the broadcasting device to the receiving device.

 These and other advantages of the present invention
25 will become apparent to those skilled in the art upon reading and understanding the following detailed description with reference to the accompanying figures.

BRIEF DESCRIPTION OF THE DRAWINGS

30 Figure 1 is a block diagram of a transmitting device according to Embodiment 1 of the present invention.

Figure 2A is a diagram illustrating a program according to Embodiment 1 before attaching receiving terminal identifiers thereto.

5 Figure 2B is a diagram illustrating the program of Figure 2A after attaching the receiving terminal identifiers thereto.

10 Figure 3 is a block diagram of the receiving device according to Embodiment 1.

Figure 4 is a flow chart illustrating the operation of the receiving device according to Embodiment 1.

15 Figure 5 is a block diagram of a transmitting device according to Embodiment 2 of the present invention.

20 Figure 6 is a diagram illustrating a program according to Embodiment 2 after attaching receiving terminal identifiers thereto.

Figure 7 is a block diagram of a receiving device according to Embodiment 2.

25 Figure 8 is a flow chart illustrating the operation of the receiving device according to Embodiment 2.

Figure 9 is a block diagram of a transmitting device according to Embodiment 3 of the present invention.

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Figure 10 is a diagram illustrating a program according to Embodiment 3 after attaching group identifiers thereto.

Figure 11 is a block diagram of a receiving device according to Embodiment 3.

5 Figure 12 is a flow chart illustrating the operation of the receiving device according to Embodiment 3.

 Figure 13A is a diagram illustrating a storage medium which stores a computer program for controlling the operation of the receiving devices according to Embodiments 1-3.

 Figure 13B is a diagram illustrating the storage medium and the receiving device according to Embodiments 1-3.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Embodiments of the present invention will now be described with reference to the Figures.

(Embodiment 1)

Figure 1 is a block diagram of a transmitting device 100 according to Embodiment 1 of the present invention. Figure 2A is a diagram illustrating a program (e.g., a broadcast program such as a TV program) according to Embodiment 1 before attaching receiving terminal identifiers thereto. Figure 2B is a diagram illustrating the program after attaching the receiving terminal identifiers thereto.

With reference to Figure 1, the transmitting device 100 includes a receiving terminal identifier

attaching section 12 and a transmission section 13.

With reference to Figures 1, 2A, and 2B, the receiving terminal identifier attaching section 12 receives a program 22 shown in Figure 2A. When the receiving terminal identifier attaching section 12 receives one or more receiving terminal identifiers 23A which identify receiving terminals 300, the receiving terminal identifier attaching section 12 produces and outputs a program 21, including a program 22 with one or more receiving terminal identifiers 23A attached thereto, as shown in Figure 2B.

The receiving terminal identifiers 23A may be, for example, telephone numbers of the owners of the receiving terminals 300. The receiving terminal identifiers 23A may alternatively be serial numbers of the receiving terminals 300, or other types of identifiers of the owners (e.g., social security numbers).

When no receiving terminal identifier 23A is received, the receiving terminal identifier attaching section 12 does not attach a receiving terminal identifier 23A to the program 22, and outputs the program 22 as the program 21.

The transmission section 13 transmits the program 21 which has been output from the receiving terminal identifier attaching section 12 to a plurality of the receiving devices 300.

Figure 3 is a block diagram of a receiving device 300 according to Embodiment 1. Figure 4 is a flow

chart illustrating the operation of a receiving device 300 according to Embodiment 1.

5 With reference to Figure 3, the receiving device 300 includes a receiving section 301, a separating section 302, an identifier storage section 303, a determination section 304, a storage control section 305, and a storage management section 306. The identifier storage section 303 stores a predetermined receiving
10 terminal identifier 23C.

 With reference to Figures 3 and 4, the receiving section 301 determines whether the program 21 has been received from the broadcasting device 100 (S401).
15

 When it is determined that the program 21 has been received from the broadcasting device 100 (YES at S401), the receiving section 301 determines whether the program 21 includes one or more receiving terminal identifiers 23A
20 (S402).

 When it is determined that the program 21 includes the receiving terminal identifiers 23A (YES at S402), the separating section 302 separates the program 21 which has been received by the receiving section 301 into the
25 receiving terminal identifiers 23A and the program 22 (S403).

 The determination section 304 retrieves the
30 receiving terminal identifier 23C stored in the identifier storage section 303 (S404), and determines whether the receiving terminal identifiers 23A include the receiving terminal identifier 23C which has been retrieved from the

identifier storage section 303 (S405).

When the determination section 304 determines that the receiving terminal identifiers 23A include the receiving terminal identifier 23C (YES at S405), the storage control section 305 stores the program 22 in the storage management section 306 (S406).

When the determination section 304 determines that the receiving terminal identifiers 23A do not include the receiving terminal identifier 23C (NO at S405), when the storage control section 305 has stored the program 22 in the storage management section 306 (S406), when it is determined that the program 21 includes no receiving terminal identifier 23A (NO at S402), or when it is determined that the program 21 is not received from the broadcasting device 100 (NO at S401), the process returns to S401.

In accordance with Embodiment 1 as described above, it is possible to provide a broadcasting device 100 and a receiving device 300 in which it is possible to transmit a program 21 from the broadcasting device 100 to particular receiving device(s) 300.

Although the identifier storage section 303 stores a single receiving terminal identifier 23C in the example described above, the present invention is not limited to this example. Alternatively, a plurality of the receiving terminal identifiers 23C may be used.

(Embodiment 2)

Figure 5 is a block diagram of a broadcasting

device 100A according to Embodiment 2 of the present invention. Figure 6 is a diagram illustrating a program 21A according to Embodiment 2 after attaching receiving terminal identifiers thereto. In Embodiment 2,
5 those elements which are also shown in Embodiment 1 are denoted by the same references and will not be further described below.

With reference to Figures 5 and 6, the broadcasting
10 device 100A further includes a one-way conversion section 11. The one-way conversion section 11 has a one-way function 11A.

The one-way function as used herein refers to a
15 function for which there is no inverse function, and which gives different outputs for different inputs. An example of such is DES (Data Encryption Standard) which is used for password management in UNIX systems.

20 The one-way conversion section 11 receives the receiving terminal identifiers 23A which identify the receiving terminals 300A. The one-way conversion section 11 converts the receiving terminal identifiers 23A into a predetermined form by using the one-way function 11A.
25 The one-way conversion section 11 outputs receiving terminal identifiers 23B which have each been converted into the predetermined form.

The receiving terminal identifier attaching
30 section 12 receives the program 22. In the case when the one-way conversion section 11 receives the receiving terminal identifiers 23A, the receiving terminal identifier attaching section 12 produces and outputs a

program 21A including the program 22 with the receiving terminal identifiers 23B attached thereto which have been output from the one-way conversion section 11.

5 When the one-way conversion section 11 does not receive a receiving terminal identifier 23A, no receiving terminal identifiers 23B is output from the one-way conversion section 11 and the receiving terminal identifier attaching section 12 does not attach a receiving terminal
10 identifier 23B to the program 22 and outputs the program 22 as the program 21A.

 The transmission section 13 transmits the program 21A to a plurality of receiving devices 300A.

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 Figure 7 is a block diagram of a receiving device 300A according to Embodiment 2. Figure 8 is a flow chart illustrating the operation of a receiving device 300A according to Embodiment 2.

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 With reference to Figure 7, the receiving device 300A includes a receiving section 301, a separating section 302, an identifier storage section 303, a determination section 304, a storage control section 305,
25 and a storage management section 306.

 The identifier storage section 303 stores a predetermined receiving terminal identifier 23D. The receiving terminal identifier 23D has been previously
30 converted into the predetermined form by using the one-way function 11A.

 With reference to Figures 7 and 8, the receiving

section 301 determines whether the program 21A has been received from the broadcasting device 100A (S801).

5 When it is determined that the program 21A has been received from the broadcasting device 100A (YES at S801), the receiving section 301 determines whether the program 21A includes one or more receiving terminal identifiers 23B (S802).

10 When it is determined that the program 21A includes the receiving terminal identifiers 23B (YES at S802), the separating section 302 separates the program 21A which has been received by the receiving section 301 into the receiving terminal identifiers 23B and the program 22
15 (S803).

 The determination section 304 retrieves the receiving terminal identifier 23D stored in the identifier storage section 303 (S804), and determines whether the
20 receiving terminal identifiers 23B include the receiving terminal identifier 23D which has been retrieved from the identifier storage section 303 (S805).

 When the determination section 304 determines that
25 the receiving terminal identifiers 23B include the receiving terminal identifier 23D (YES at S805), the storage control section 305 stores the program 22 in the storage management section 306 (S806).

30 When the determination section 304 determines that the receiving terminal identifiers 23B do not include the receiving terminal identifier 23D (NO at S805), when the storage control section 305 has stored the program 22 in

the storage management section 306 (S806), when it is determined that the program 21A includes no receiving terminal identifier 23B (NO at S802), or when it is determined that the program 21A is not received from the
5 broadcasting device 100A (NO at S801), the process returns to S801.

In accordance with Embodiment 2 as described above, the receiving terminal identifiers 23B, which are converted
10 into the predetermined form by using the one-way function 11A, are transmitted, so that it is possible to ensure the confidentiality of the receiving terminal identifiers which are transmitted from the broadcasting device 100A to the receiving devices 300A.

15 Although the receiving terminal identifier 23D stored in the identifier storage section 303 has been previously converted into the predetermined form by using the one-way function in the example described in
20 Embodiment 2, the present invention is not limited to this example. If the receiving device is provided with a decryption section for decrypting the receiving terminal identifiers 23B which have been converted into the predetermined form by using the one-way function 11A, the
25 receiving terminal identifier 23D does not need to be converted into the predetermined form.

(Embodiment 3)

Figure 9 is a block diagram of a transmitting
30 device 100B according to Embodiment 3 of the present invention. Figure 10 is a diagram illustrating a program according to Embodiment 3 after attaching group identifiers thereto. In Embodiment 3, those elements which are also

shown in Embodiment 1 and Embodiment 2 are denoted by the same references and will not be further described below.

5 In Embodiment 3, group identifiers, which identify a plurality of receiving terminals as a group, are used in place of the receiving terminal identifiers described above in Embodiment 1 and Embodiment 2.

10 With reference to Figure 9, the transmitting device 100B, similar to the transmitting device 100A of Embodiment 2, includes a one-way conversion section 11, a receiving terminal identifier attaching section 12, and a transmission section 13. The one-way conversion section 11 has a one-way function 11A.

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The one-way conversion section 11 receives group identifiers 24A, which identify a plurality of receiving terminals 300B as a group. A group identifier 24A may be the whole or part of a zip code. For example, a group identifier 24A may be "573" which is a part of a zip code "573-1105". A group identifier 24A may be an area code or an area code plus a local area code of a telephone number. For example, a group identifier 24A may be an area code "03" or an area code plus a local area code "03 (6949)" of a telephone number "03 (6949) 5831".

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The one-way conversion section 11 converts the group identifiers 24A into a predetermined form using the one-way function 11A. The one-way conversion section 11 outputs receiving terminal identifiers 24B which have been converted into the predetermined form.

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With reference to Figures 9 and 10, the receiving

terminal identifier attaching section 12 receives the program 22. In the case when the one-way conversion section 11 receives the group identifiers 24A, the receiving terminal identifier attaching section 12 produces and outputs a program 25 including a program 22 with the group identifiers 24B attached thereto which has been output from the one-way conversion section 11.

When the one-way conversion section 11 does not receive a group identifier 24A, no group identifier 24B is output from the one-way conversion section 11 and receiving terminal identifier attaching section 12 does not attach a group identifier 24B to the program 22 and outputs the program 22 as the program 25.

The transmission section 13 transmits the program 25 to a plurality of the receiving devices 300B.

Figure 11 is a block diagram of the receiving device 300B according to Embodiment 3. Figure 12 is a flow chart illustrating the operation of the receiving device 300B according to Embodiment 3. In Embodiment 3, those elements which are also shown in Embodiment 1 and Embodiment 2 are denoted by the same references and will not be further described below.

With reference to Figure 11, the receiving device 300B, similar to the receiving device 300 of Embodiment 1, includes a receiving section 301, a separating section 302, an identifier storage section 303, a determination section 304, a storage control section 305, and a storage management section 306. The identifier storage section 303 stores a predetermined group

identifier 24C. The group identifier 24C has been previously converted into the predetermined form using the one-way function.

5 With reference to Figures 11 and 12, the receiving section 301 determines whether the program 25 has been received from the broadcasting section 100B (S1201).

10 When it is determined that the program 25 has been received from the broadcasting section 100B (YES at S1201), the receiving section 301 determines whether the program 25 includes one or more group identifiers 24B (S1202).

15 When it is determined that the program 25 includes the group identifiers 24B (YES at S1202), the separating section 302 separates the program 25 which has been received by the receiving section 301 into the group identifiers 24B and the program 22 (S1203).

20 The determination section 304 retrieves the group identifier 24C stored in the identifier storage section 303 (S1204) and determines whether the group identifiers 24B include the receiving terminal identifier 24C which has been retrieved from the identifier storage section 303
25 (S1205).

30 When the determination section 304 determines that the group identifiers 24B include the group identifier 24C (YES at S1205), the storage control section 305 stores the program 22 in the storage management section 306 (S1206).

 When the determination section 304 determines that the group identifiers 24B do not include the group

identifier 24C (NO at S1205), when the storage control section 305 has stored the program 22 in the storage management section 306 (S1206), when it is determined that the program 25 includes no group identifier 24B (NO at S1202), or when it is determined that the program 25 is not received from the broadcasting device 100B (NO at S1201), the process returns to S1201.

In accordance with Embodiment 3 as described above, the program 25 can be transmitted from the broadcasting device 100B to a particular group of the receivers 300B.

Although the group identifiers 24B which have been converted into the predetermined form by using the one-way function 11A are transmitted in the example described in Embodiment 3, the present invention is not limited to this example. Similar effects may be achieved by transmitting the group identifiers 24A which are not converted into the predetermined form while the group identifier 24C which has not been converted into the predetermined form is stored in the identifier storage section 303.

Figure 13A is a diagram illustrating a storage medium which stores a computer program for controlling the operation of the receiving devices according to an embodiment of the present invention. Figure 13B is a diagram illustrating the storage medium and the receiving device according to an embodiment of the present invention.

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The receiving devices 300, 300A, and 300B, which are described above in Embodiments 1-3, include a control section (not shown), and the control section controls the

operation of the receiving section 301, the separating section 302, the identifier storage section 303, the determination section 304, the storage control section 305, and the storage management section 306 based on a
5 predetermined computer program.

The predetermined computer program may be recorded on, for example, the recording medium 308, and may be supplied to the receiving device 300 by the recording
10 medium 308. Alternatively, the predetermined computer program may be previously stored in the memory (not shown) provided in the control section.

The predetermined computer program may
15 alternatively be downloaded through a network, and supplied to the receiving device 300.

In accordance with the present invention as described above, a broadcasting device and a receiving
20 device can be provided with which it is possible to transmit the information from the broadcasting device to a particular receiving device.

Furthermore, in accordance with the present
25 invention, the broadcasting device and the receiving device can be provided with which it is possible to ensure confidentiality of the information to be transmitted when the information is transmitted from the broadcasting device to the receiving device.

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Various other modifications will be apparent to and can be readily made by those skilled in the art without departing from the scope and spirit of this invention.

Accordingly, it is not intended that the scope of the claims appended hereto be limited to the description as set forth herein, but rather that the claims be broadly construed.



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WHAT IS CLAIMED IS:

1. A broadcasting device for broadcasting a program with one or more receiving terminal identifiers attached thereto for identifying a receiving terminal.
2. A broadcasting device according to claim 1, wherein the receiving terminal identifiers have been converted into a predetermined form.
3. A broadcasting device according to claim 2, wherein the predetermined form is provided by using a one-way function.
4. A broadcasting device according to claim 1, wherein the broadcasting device broadcasts a program with one or more group identifiers, which identify a plurality of the receiving terminals as a group, attached thereto.
5. A broadcasting device according to claim 1, wherein each of the receiving terminal identifiers is a telephone number.
6. A broadcasting device according to claim 4, wherein each of the group identifiers is the whole or part of a zip code.
7. A broadcasting device according to claim 4, wherein each of the group identifiers is an area code or an area code plus a local area code of the telephone number.
8. A receiving device, comprising:
 - a receiving section for receiving a program with one or more receiving terminal identifiers attached thereto;
 - an identifier storage section for storing an associated receiving terminal identifier;



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a storage management section for storing and managing the program;

a separating section for separating the program with the receiving terminal identifiers attached thereto which has been received by the receiving section into the receiving terminal identifiers and the program;

a determination section for determining whether the one or more receiving terminal identifiers separated by the separating section include the associated receiving terminal identifier stored in the identifier storage section; and

a storage control section for storing the program separated by the separating section in the storage management section when the determination section determines that one of the one or more receiving terminal identifiers include the associated receiving terminal identifier.

9. A receiving device according to claim 8, wherein the receiving terminal identifiers have been converted into a predetermined form.

10. A receiving device according to claim 9, wherein the predetermined form is provided by using a one-way function.

11. A receiving device according to the claim 8, wherein:
the receiving section receives a program with one or more group identifiers attached thereto;

the identifier storage section stores an associated group identifier;

the separating section separates the program with the one or more group identifiers attached thereto which has been received by the receiving section into the group



identifiers and the program; and

the determination section determines whether the one or more group identifiers separated by the separating section include the associated group identifier stored in the identifier storage section.

12. A receiving device according to claim 8, wherein each of the receiving terminal identifiers is a telephone number.

13. A receiving device according to claim 11, wherein each of the group identifiers is the whole or part of a zip code.

14. A receiving device according to claim 11, wherein each of the group identifiers is an area code or an area code plus a local area code of a telephone number.