

Voice information system and method.

The present invention relates to voice information systems and methods, particularly for the visually impaired.

5 Document FR2880459 describes an example of such a method, in which information about the next buses to arrive at the station is communicated vocally to travelers waiting at a bus stop.

10 This known method is satisfactory, but has the disadvantage that ambient noise such as traffic noise can interfere with the vocally delivered information, and that this vocal delivery of information contributes to noise pollution in urban areas.

15 The present invention is intended to overcome these disadvantages.

In the invention, a method of the kind in question comprises the following steps:

- a distribution step in which information is distributed in the form of an ultrasonic signal,
- 20 - a receiving step in which said ultrasonic signal is captured by a mobile telephone, using the microphone of said mobile telephone,
- an information step in which the ultrasonic signal is converted into voice information in a human
- 25 language by said mobile telephone and said voice information is emitted by an acoustic transducer that is part of the mobile telephone.

30 Through these arrangements, the information is distributed in ultrasonic form without generating noise pollution and without interference from the ambient noise, and is then directly converted into a voice message by the user's mobile telephone, thereby delivering the voice message with the best possible quality. In addition, this ultrasonic distribution method allows the information to be

35 received without difficulty by the mobile telephone, and in

particular with fewer problems in establishing communication between the facility that distributes the information and the mobile telephone (this mode of communication is much simpler and reliable in this respect
5 than short-range radio communications).

In various embodiments of the method according to the invention, one or more of the following arrangements may optionally be used:

- 10 - during the information step, said information is emitted by a speaker that is part of the mobile telephone;
- during the information step, the mobile telephone is first made to ring or vibrate, then said voice information is emitted once the mobile telephone has been answered by a user;
- 15 - during the information step, said voice information is emitted in response to an action initiated by the user (for example the launching of an application);
- during the distribution step, said information is distributed in the form of a digitally encoded ultrasonic
20 signal, and during the information step, said ultrasonic signal is decoded;
- during the distribution step, there are multiple pieces of information in ultrasonic signal form, and during the information step, the user selects the information he
25 or she wants to hear;
- during the distribution step, said information is distributed at a bus stop, and said information at least relates to the arrival of an incoming bus.

The invention also relates to a voice information
30 system, comprising:

- an electronic distribution device adapted for distributing information in the form of an ultrasonic signal,
- at least one mobile telephone having a microphone
35 adapted for capturing said ultrasonic signal and an electronic processing unit adapted for converting the

ultrasonic signal into voice information in a human language and for emitting said voice information by an acoustic transducer that is part of the mobile telephone.

Other features and advantages of the invention will be apparent from the following description of one of its embodiments, given by way of non-limiting example, with reference to the accompanying drawings.

In the drawings:

- figure 1 is a perspective view of a bus stop where the invention can be implemented,
- figure 2 is a block diagram illustrating the electronic device used in the bus stop of figure 1, in cooperation with the mobile telephone of a user.

In the different figures, identical references denote identical or similar elements.

Figure 1 shows a station 1 that is part of a public transportation network, such as a bus stop. The following description only refers to an example for buses, but the invention is applicable to other types of public transportation, such as trains, subways, or tramways. The invention is also applicable to the transmission of voice information to a user in any other public place. For example, the invention allows distributing voice information from public toilets (to indicate whether or not they are in service or are occupied), from trash bins (to indicate proximity), or from any other street object or fixture.

The station 1 may, for example, be in the form of a shelter having a roof 2 resting on a support structure 3 and possibly including an illuminated display panel 4 or an electronic advertising or informational display. The station 1 may also further comprise a digital sign 5, integrated for example with the roof of said station, for displaying information about the next bus or buses arriving at said station and the wait times or arrival times, for example based on information received from a server 9

(SERV) which can be seen in figure 2.

The station 1 is equipped with an electronic device for communicating information to the mobile telephone 7 of a user P (figure 1) who is at or near the station, especially a visually impaired user. The information in question includes the above information about the next bus arriving at the station, and/or general information or other specific types of information.

This electronic device may be integrated for example into the display panel 4 or possibly into the digital sign 5 or into any other portion of the station 1, and comprises for example:

- an electronic processing unit 8 such as a microprocessor or microcontroller (CPU), which communicates in a wired or wireless manner with said server 9 and controls the digital sign 5 (DISP) according to information received from the server 9,

- a speaker 6 or any acoustic transducer adapted for distributing an ultrasonic signal at and/or in the vicinity of the station 1, this ultrasonic signal being inaudible to the human ear.

The mobile telephone 7 of the user P comprises, in a conventional manner:

- at least one microphone 10 (MICR) adapted for capturing said ultrasonic signal,

- at least one electronic processing unit (CPU) which receives the information captured by the microphone 10,

- at least one acoustic transducer 12, which can be a speaker integrated into the earphone of the mobile telephone 7 or into an earpiece that is wired or wireless.

The system described above operates as follows.

In the example considered here, the server sends information to the processing unit 8 of the station 1. This information concerns the next buses arriving at the station 1 and their arrival times and/or corresponding wait times.

It is possible for the processing unit 8 to receive other information from the server 9 or have information stored in memory, such as general information (weather or any other subject of general interest) and/or local information
5 related to the location of the station 1 (cultural or recreational or tourist information for example, or local advertisements).

This information is distributed by the processing unit 8, at the station 1, via the speaker 6, in the form of
10 a digitally encoded ultrasonic signal (or possibly modulated by analog modulation). The ultrasonic signal is inaudible to humans and therefore does not generate noise pollution, and undergoes little or no interference from the ambient street noise.

15 When a user P is at the station 1 and if he or she has a mobile telephone 7 programmed for this purpose, said mobile telephone captures said ultrasonic signal with its microphone 10 and the processing unit 11 of the mobile telephone decodes the captured ultrasonic signal and
20 converts it into voice information understandable by the user, then emits said voice information via the acoustic transducer 12, preferably directly to the ear of the user P, so that said user receives said information clearly but without disturbing the other people at the station 1.

25 Optionally, the processing unit 11 of the mobile telephone 7 is programmed so that it first rings or vibrates the mobile telephone when the ultrasonic signal is received, then emits said voice information once the phone has been answered by the user.

30 Optionally, the processing unit 11 can emit said voice information in response to an action initiated by the user, for example the launching of a dedicated application able to decode the captured ultrasonic signal and emit the voice information.

35 Optionally, when the processing unit 8 of the station 1 distributes several types of information in

ultrasonic form as described above, the processing unit 11 of the phone can be programmed to have the user select the type of information he or she wants to hear (for example, information about the next buses or general information or
5 local information), with the possibility of making this choice by voice command.

As a result of the above, the invention is particularly suitable for the transmission of information to the visually impaired in public places.

CLAIMS

1. Voice information method, comprising the following steps:
- 5 - a distribution step in which information is distributed in the form of an ultrasonic signal,
- a receiving step in which said ultrasonic signal is captured by a mobile telephone, using the microphone of said mobile telephone,
- 10 - an information step in which the ultrasonic signal is converted into voice information in a human language by said mobile telephone and said voice information is emitted by an acoustic transducer that is part of the mobile telephone.
- 15 2. Method of claim 1, wherein, during the information step, said information is emitted by a speaker that is part of the mobile telephone.
3. Method of claim 1 or claim 2, wherein, during the information step, the mobile telephone is first made to
- 20 ring or vibrate, then said voice information is emitted once the mobile telephone has been answered by a user.
4. Method of claim 1 or claim 2, wherein, during the information step, said voice information is emitted in response to an action initiated by the user.
- 25 5. Method according to any preceding claim, wherein, during the distribution step, said information is distributed in the form of a digitally encoded ultrasonic signal, and during the information step, said ultrasonic signal is decoded.
- 30 6. Method according to any preceding claim, wherein, during the distribution step, there are multiple pieces of information in ultrasonic signal form, and during the information step, the user selects the information he or she wants to hear.
- 35 7. Method according to any preceding claim, wherein, during the distribution step, said information is

distributed at a bus stop, and said information at least relates to the arrival of an incoming bus.

8. Voice information system, comprising:

- an electronic distribution device adapted for
5 distributing information in the form of an ultrasonic signal,
- at least one mobile telephone having a microphone adapted for capturing said ultrasonic signal and an electronic processing unit adapted for converting the
10 ultrasonic signal into voice information and for emitting said voice information by an acoustic transducer that is part of the mobile telephone.