

VOICE OUTPUT APPARATUS AND VOICE OUTPUT METHOD

[Field of the Invention]

5 [0001]

The present invention relates to a voice output apparatus and voice output method that output pronunciations of words and meanings of the words.

[Background Art]

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[0002]

Conventionally, as a tool for learning a foreign language, for example, a wordbook (also referred to as a m used. English words are written on front surfaces and meanings of English words are written on rear surfaces of the cards.

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[0003]

Recently, techniques to store words and meanings of the words as electronic data and to make a user learn the words in the same way as in that of the wordbook described above have been considered.

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[0004]

As one of those techniques, there has been an electronic dictionary apparatus that is highly portable and suitable for learning words with a portable display, which is provided separately from the electronic dictionary and takes dictionary data from the electronic dictionary thereinto, by displaying the taken data at hand of a user and outputting voice of pronunciation from an earphone (for example, see Japanese Patent Application Laid-open No. 2009-266024).

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30 [0005]

Further, a self-test study machine that sequentially takes words and meanings of the words as image data of their character strings and each piece of the taken image data is read and displayed in an order in accordance with a user operation, whereby a user can learn desired words easily has also been considered (for example, see Japanese Patent Application Laid-open No. H08-83039).

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[0006]

However, in the portable display described above, there has been a demand not only to output the words, stored as electronic data, simply in a switched order but to further enhance convenience in learning words.

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[0007]

The present invention has been made in view of the foregoing circumstances and has an object to provide a voice output apparatus and a voice output method capable of further enhancing convenience in learning words with voice.

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[Summary of the Invention]

[0008]

A voice output apparatus according to one feature includes: a word data storage that stores first voice data in a first language and second voice data in a second language as voice data with respect to respective words; a replay mode selector that makes a user select one replay mode from among replay modes for replaying the first voice data and the second voice data of the respective words; and a word outputter that outputs the first voice data and the second voice data of the respective words as the voice data from a voice outputter in an order in accordance with the replay mode selected by the replay mode selector.

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[0009]

A voice output method according to one feature used in a voice output apparatus including word data memory that stores first voice data in a first language and second voice data in a second language with respect to respective words as voice data includes: a replay mode selecting step of selecting one replay mode from among replay modes for replaying the first voice data and the second voice data of the respective words, in response to a user operation; and a word output step of outputting the first voice data and the second voice data of the respective words as the voice data from a voice outputter in an order in accordance with the replay mode selected in the replay mode selecting step.

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[Effect of the Invention]

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[0010]

According to the present invention, it is possible to further enhance

convenience in learning words with voice.

[Brief Description of Drawings]

5 [0011]

Fig. 1 is a diagram illustrating an exterior configuration of an electronic wordbook 10 according to an embodiment of a voice output apparatus of the present invention.

10 Fig. 2 is a block diagram illustrating a configuration of an electronic circuit of the electronic wordbook 10.

Fig. 3 is a diagram illustrating data of words generated as an English-Japanese simple dictionary among a word database 22b stored in a storage device 22 of the electronic wordbook 10.

15 Fig. 4 is a flowchart illustrating a word output process by the electronic wordbook 10.

Fig. 5 is a flowchart illustrating a key process in a "turning (i.e. a manual replay) mode" accompanying a word output process of the electronic wordbook 10.

Fig. 6 is a flowchart illustrating a key process in an "automatic replay mode" accompanying a word output process of the electronic wordbook 10.

20 Fig. 7 is a diagram illustrating a display operation accompanying a word output process of the electronic wordbook 10.

[Description of Embodiments]

25 [0012]

Hereinafter, an embodiment of the present invention will be described with reference to the drawings.

[0013]

30 Fig. 1 is a diagram illustrating an exterior configuration of an electronic wordbook 10 according to an embodiment of a voice output apparatus of the present invention.

[0014]

35 The electronic wordbook 10 is configured as a portable apparatus provided exclusively for an electronic wordbook described below. Alternatively, a wordbook program having a function described below may be incorporated in a smartphone, an

electronic book, a portable game machine, and the like to provide an electronic wordbook.

[0015]

5 This electronic wordbook 10 includes a main body case of, for example, a card size provided with a key inputter 11 along a left end of a front surface and provided with a liquid crystal display 12 (hereinafter a display 12) in an area other than the key inputter 11.

10 [0016]

 The key inputter 11 is provided with a [next] key 11a for changing data of a word displayed on the display 12 into a next data, a [previous] key 11b to move to a previous data, a [check] key 11c with which check data CK is written in or deleted from a check box BC of a word on the display, and a [voice] key 11s for making voice
15 data of the data on the display output from earphones 13R and 13L of a voice outputter 13. In an automatic replay mode, the [Voice] key 11s functions as a key for temporarily stopping and releasing the stop.

[0017]

20 Here, in a case of an English-Japanese dictionary, for example, data of a word includes data of an English word and data of meaning in Japanese of the word. One of the data is referred to as data in a first language and the other of the data is referred to as data in a second language.

25 [0018]

 The electronic wordbook 10 has a communication function with external information equipment, and stores a word database based on a dictionary database transferred from an electronic dictionary 30. The word database is constituted by words and simplified explanation information. For example, this data is generated
30 as simple dictionary data including main explanation extracted from detailed explanation of a meaning corresponding to each word recorded in the dictionary database while excluding additional description such as examples. Based on this word database, words and meanings of the words in a range selected as a learning target are replayed by being displayed or pronounced sequentially in various output
35 forms described later.

[0019]

Fig. 2 is a block diagram illustrating a configuration of an electronic circuit of the electronic wordbook 10.

5 [0020]

The electronic circuit of the electronic wordbook 10 is configured by a computer. An operation of the computer is controlled by a program. The electronic circuit is provided with a CPU 21.

10 [0021]

This CPU 21 controls an operation of each part of the circuit by using a RAM 24 as working memory in accordance with a wordbook control program 22a stored in advance in a storage device 22. If the electronic wordbook 10 is provided with an external interface capable of communicating with apparatuses other than an electronic dictionary 30, the wordbook control program 22a may be read into the storage device 22 from an external recording medium, such as a ROM card, and a web server (in this case, a program server) on the Internet N.

[0022]

20 The wordbook control program 22a stored in the storage device 22 is started in accordance with an input signal in response to a user operation from the key inputter 11, or a communication signal transmitted between the electronic dictionary 30 or other information equipment connected via a communication module 23.

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[0023]

In this manner, the storage device 22, the communication module 23, the RAM 24, the key inputter 11, the display 12 and the voice outputter 13 (i.e., the earphones 13R and 13L) are connected to the CPU 21.

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[0024]

The wordbook control program 22a stored in the storage device 22 includes a system program for controlling the entire operation of the electronic wordbook 10 and a communication program for performing data communication with the electronic dictionary 30 via the communication module 23. As the wordbook control program 22a, a program for controlling display, pronunciation and check processes, such as a word database generation process for generating a word database 22b

based on a dictionary database transferred from the electronic dictionary 30, a word output process for displaying and pronouncing data of each word stored in the word database 22b, and also writing/deleting the check data CK, and the like, are included.

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[0025]

Fig. 3 is a diagram illustrating data of words generated as an English-Japanese simple dictionary among the word database 22b stored in the storage device 22 of the electronic wordbook 10.

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[0026]

In this data of words, each word (English) and meanings thereof (Japanese) are respectively correlated with voice data of pronunciation thereof and each word has a flag indicating existence of the check data CK. This check data CK is, for example, data used by the user to check whether the meaning of the word has been memorized. In other word, the storage device 22 stores first voice data in a first language and second voice data in a second language as voice data with respect to words. Further, the storage device 22 stores, for each of the words, spelling data in the first language, pronunciation data as the first voice data, character data indicating a meaning in the second language, and meaning voice data corresponding to the character data as the second voice data.

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[0027]

The RAM 24 includes, in addition to a display data memory 24a storing display data to be displayed on the display 12, a turning order memory 24b as a workspace accompanying the word output process, a replay range memory 24c, a replay mode memory 24d, a replay target memory 24e, and the like.

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[0028]

The turning order memory 24b stores turning order data indicating whether a replay target word is output in an order in the first language (English) followed by the second language (Japanese) or in an order in the first language (Japanese) followed by the second language (English) in response to a user operation.

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[0029]

The replay range memory 24c stores a range of words to be learned this time selected from the word database 22b in response to the user operation.

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[0030]

The replay mode memory 24d stores data that defines how the word to be learned is replayed. In the present embodiment, replay mode data is stored in response to a user operation, replay mode data indicating any one of a "listen once (automatic replay) mode" in which each word and meaning of the word are respectively replayed once automatically, a "listen 3 times (automatic replay) mode" in which each word and meaning of the word are respectively replayed 3 times automatically, or a "turning (manual replay) mode" in which replay is performed in response to manipulation of a key. In other word, replay mode memory 24d sotres replay modes including an automatic replay mode and a manual replay mode. The automatic replay mode being a mode where the first voice data and the second voice data are output in the order automatically switched. The manual replay mode being a mode where the first voice data and the second voice data are output in the order manually switched in response to a user operation.

[0031]

The replay target memory 24e stores replay target data for designating replay target. The replay target data designates a replay target indicating whether all the words in the learning range should be set to be the replay target, only the words to which the check data CK is not added should be set to be the replay target, or only the words to which the check data CK is added should randomly be set to be the replay target.

[0032]

The thus-configured electronic wordbook 10 implements a function described in the following description of operation by the CPU 21 controlling an operation of each part of the circuit in accordance with an instruction described in the wordbook control program 22a (including a program for executing the word database generation process, the word output process, and the like), and by software and hardware cooperatively operating.

[0033]

Next, an operation of the thus-configured electronic wordbook 10 will be described.

[0034]

Fig. 4 is a flowchart illustrating the word output process by the electronic

wordbook 10.

[0035]

Fig. 5 is a flowchart illustrating a key process in the "turning (manual
5 replay) mode" accompanying the word output process of the electronic wordbook 10.

[0036]

Fig. 6 is a flowchart illustrating a key process in the "automatic replay mode"
10 accompanying the word output process of the electronic wordbook 10.

[0037]

Fig. 7 is a diagram illustrating a display operation accompanying the word
output process of the electronic wordbook 10.

15 [0038]

In response to a user operation, in a setting menu M1 displayed on the
display 12 as described in Fig. 7A, if an item [turning order] is selected in response
to an operation of the [next] key 11a or the [previous] key 11b and the [check] key 11c
is operated, a turning order menu M2 is displayed as described in Fig. 7B. In a
20 state where a menu screen is displayed, the [check] key 11c functions as a decision
key.

[0039]

In this turning order menu M2, if a turning order in which word replay is set
25 to "the first language (English) followed by the second language (Japanese)" is
selected and the [check] key 11c is operated, the selected turning order (English
followed by Japanese) is stored in the turning order memory 24b.

[0040]

30 Further, in a selection menu of a study range which is not illustrated, if a
range to be learned this time is selected from among study ranges (Sections) as, for
example, an English word text stored in the word database 22b, the selected study
range is stored in the replay range memory 24c (step S1).

35 [0041]

Subsequently, in a replay mode selection window W1 displayed on the
display 12 as described in Fig. 7C, if either of the three replay modes (listen once

(automatic replay)/ listen 3 times (automatic replay)/ turning (manual replay)) is selected by using a reversal cursor H and the [check] key 11c is operated, the selected replay mode is stored in the replay mode memory 24d (step S2).

5 [0042]

Then, as illustrated in Fig. 7D, a replay target selection window W2 is displayed on the display 12. In this replay target selection window W2, among the selected study range, whether all the words are to be replayed, only the words to which the check data CK is not added are to be replayed, or only the words to which the check data CK is added are to be replayed randomly is selected by a user. If the [check] key 11c is operated, the selected replay target is stored in the replay target memory 24e (step S3).

[0043]

15 Then, the first word is read from the replay target words from the replay range in the word database 22b (see Fig. 3) stored in the replay range memory 24c (step S4).

[0044]

20 If the replay mode stored in the replay mode memory 24d is determined to be the listen once (automatic replay) mode (step S5 (Yes)), in accordance with the turning order (English followed by Japanese) stored in the turning order memory 24b, for example, the first English word "relate" is displayed as illustrated in Fig. 7E and its pronunciation "rileit" RS is replayed from the voice outputter 13 (step S6).

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[0045]

Subsequently, after displaying the English word for a certain period of time (for example, 5 seconds), as illustrated in Fig. 7F, the meaning "wo kanren zukeru..." (Japanese) in the second language (Japanese) corresponding to the English word "relate" is displayed on the display 12 and also voice "kanren zukeru" (Japanese voice corresponding to "relate") RS reading the meaning is replayed from the voice outputter 13 (step S7).

30

[0046]

35 If it is determined that there is a next replay target word (step S8 (Yes)), the next word is read after a certain time period (for example, 2 seconds) (step S9). Then, as illustrated in Fig. 7G, an English word "improve" is displayed and

pronunciation thereof "impru:v" RS is replayed (step S6). After 5 seconds elapsed, a meaning in Japanese "wo koujou saseru... (Japanese)" is displayed and voice "koujou saseru" (Japanese voice corresponding to "improve") is replayed (step S7).

5 [0047]

Then, the replay target word is sequentially read in the same manner as described above and each word is replayed once in an order in the first language (English word) followed by the second language (a meaning in Japanese). If it is determined that no next word exists (step S8 (No)), the word output process in the series of listen once (automatic replay) mode is completed (End).

[0048]

On the other hand, if it is determined that the replay mode is the listen 3 times (automatic replay) mode (step S10 (Yes)), in the same manner as in the output process in the listen once mode, each replay target word is displayed 3 times and voice thereof is replayed 3 times in an order in the first language (English word) followed by the second language (a meaning in Japanese) (steps S11 to S15).

[0049]

In this manner, since each replay target word in the study range selected by the user can be displayed a predetermined times automatically in the order set by the user and voice thereof can be output, it is possible to further enhance convenience in learning words with voice.

25 [0050]

On the other hand, if it is determined that the replay mode is the turning mode (step S16 (Yes)), a process in response to a key operation in the key inputter 11 is performed (step S17: see Fig. 5). That is, in the turning mode, all of the turning to the next word data and voice output are performed in response to the key operation of the user.

[0051]

If, for example, the [voice] key 11s is operated in a state where the first English word "relate" is displayed on the display 12 as illustrated in Fig. 7E (step T1 (Yes)), voice of the pronunciation "rileit" RS is output from the voice outputter 13 (step T2).

[0052]

If the [next] key 11a is operated (step T7 (Yes)), data of a next language is read and displayed on the display 12 (step T8). That is, as illustrated in Fig. 7F, a meaning in Japanese "(kanren zukeru ...)" of the English word "relate" is read and displayed on the display 12. Then if the [next] key 11a is operated (step T7 (Yes)), data of a next language, that is the English word "improve," is read and displayed on the display 12 (step T8).

[0053]

On the other hand, if the [previous] key 11b is operated (step T9 (Yes)), data of a previous language is read and displayed on the display 12 (step T10). That is, if "a meaning in Japanese "wo kanren zukeru..." is output as illustrated in Fig. 7F, the English word "relate" is displayed on the display 12 as illustrated in Fig. 7E. If the [previous] key 11b is operated in a state where the English word "improve" is output as Fig. 7G (step T9 (Yes)), the mean in Japanese "wo kanren zukeru..." of the previous word is displayed on the display 12 as illustrated in Fig. 7F (step T10). If the [voice] key 11s is operated in a state where data of English or Japanese is displayed (step T1 (Yes)), voice corresponding to the data is output from the voice outputter 13 (step T2).

[0054]

On the other hand, if the [check] key 11c is operated (step T3 (Yes)), in a case where the check box BC in the data on the display has not been checked (step T4 (Yes)), the check data CK is written (step T5) and, in a case where the check data CK is already written (step T4 (No)), the check data CK is deleted (step T6).

[0055]

In this manner, since the user can display the data of words and meanings at his or her own pace while moving the data to the next data or to the previous data and output the voice as necessary, it is possible to further enhance convenience in learning words.

[0056]

On the other hand, if a key operation is performed in a state where a in the listen once (automatic replay) mode or the listen 3 times (automatic replay) mode, the key process illustrated in Fig. 6 is performed. In this process, if the [voice] key 11s is operated in the automatic replay (step A1 (Yes)), it is determined whether it is

being temporarily stopped (step A2). If it is not being temporarily stopped, it is temporally stopped (step A3). If it is being temporarily stopped, the temporal stop is released (step A4). That is, each time the key operation is performed, automatic replay is temporarily stopped or resumed (steps A2 to A4).

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[0057]

Then, if the [next] key is operated in a state where, for example, a replay target English word "relate" in the first language (English) or a meaning "in the second language (Japanese) "wo kanren zukeru..." is output as illustrated in Fig. 7E or Fig. 7F (step A10 (Yes)), in either case of not being temporarily stopped or being temporarily stopped, a next word of the replay target word is read and, as illustrated in Fig. 7G, the English word "improve" in the first language (English) is displayed (steps A11 to A13).

15 [0058]

If the [previous] key 11b is operated in a state where each word is replayed automatically (step A14(Yes) followed by A15 (No)), in either case that an English word in the first language (English) is being output or a meaning in the second language (Japanese) is being output, a previous word of the replay target word is read and the English word in the first language (English) is output (step A16).

[0059]

On the other hand, if the [previous] key 11b is operated during temporal stop in the automatic replay mode (step A14(Yes) followed by A15 (Yes)), in a case where a meaning in the second language (Japanese) is being replayed at that time (step A17 (Yes)), the English word in the first language (English) of the word is read and displayed (step A18).

[0060]

During temporal stop in the automatic replay mode in the same manner as described above (step A14(Yes) followed by A15 (Yes)), in a case where the English word in the first language (English) is being replayed at that time (step A17 (No)), the previous English word is read and displayed (step A16).

35 [0061]

If the [check] key 11c is operated in the automatic replay mode (step A5 (Yes)), whether it is being temporarily stopped is determined (step A6). in a case where it

is being temporarily stopped (step A6 (Yes)), if the checked check box BC displayed together with the displayed English word or the Japanese meaning is not checked (step A7 (Yes)), the check data CK is written in (step A8) and, if the check data CK is already written in (step A7 (No)), the check data CK is deleted (step A9).

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[0062]

In a case where the [check] key 11c is operated during the automatic replay (step A6 (No)), the operation of the [check] key 11c becomes invalid. That is, since output data changes sequentially in the automatic replay mode, checking is made after the temporal stop so that the user may not add the check data accidentally.

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[0063]

Any of the technique of each process by the electronic wordbook 10 described in each embodiment described above, that is, each technique, such as the word output process described in the flowchart of Fig. 4, the key process in the manual replay mode accompanying the word output process described in flowchart of Fig. 5, and the key process in the automatic replay mode accompanying the word output process described in flowchart of Fig. 6 may be stored, as programs that may make a computer execute, in a medium of an external storage apparatus, such as a memory card (a ROM card, a RAM card and the like), a magnetic disc (a floppy disk, hard disk, and the like), an optical disk (a CD-ROM, a DVD, and the like) and a semiconductor memory, and may be distributed. A computer (i.e., a control apparatus) of the electronic equipment (10) storing the word database (22b) reads a program stored in a medium of this external storage apparatus into the storage device (22) and an operation is controlled by this read program (22a). Therefore, a word output function described in each of the embodiments can be implemented and the same process as the technique described above can be performed.

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[0064]

The data of the program for implementing each technique described above can be transmitted in a form of a program code on a communication network. The data of the program described above can be taken, from the computer apparatus (i.e. a program server) connected to this communication network, into the electronic equipment (10) storing the word database (22b) and the data can be stored in the storage device (22), thereby implementing the word output function described above.

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[0065]

The present invention is not limited to each embodiment described above and may be modified variously without departing from the scope thereof in the implementation. Further, inventions in various steps are included in each
5 embodiment described above and various inventions may be extracted by suitably combining constituent features disclosed. For example, even in a case where some constituent features are excluded from the entire constituent features described in each embodiment or some constituent features are combined in different forms.

CLAIMS

1. A voice output apparatus, comprising:

a word data storage that stores first voice data in a first language and second
5 voice data in a second language as voice data with respect to respective words;

a replay mode selector that makes a user select one replay mode from among
replay modes for replaying the first voice data and the second voice data of the
respective words; and

a word outputter that outputs the first voice data and the second voice data
10 of the respective words as the voice data from a voice outputter in an order in
accordance with the replay mode selected by the replay mode selector.

2. The voice output apparatus according to claim 1, wherein

the replay mode selector makes the user select one replay mode from among
15 replay modes including an automatic replay mode and a manual replay mode, the
automatic replay mode being a mode where the first voice data and the second voice
data are output in the order automatically switched, the manual replay mode being
a mode where the first voice data and the second voice data are output in the order
manually switched in response to a user operation.

3. The voice output apparatus according to claim 2, comprising:

a temporary stopper that temporarily stops an output of the voice data in
response to a user operation in a state where the first voice data and the second voice
data of the respective words are output in the order automatically switched by the
25 word outputter when the automatic replay mode is selected by the replay mode
selector; and

a word checker that stores check data in correlation with the respective
words in response to a user operation during the temporal stop of the output of the
voice data of the respective words by the temporary stopper.

4. The voice output apparatus according to claim 1, wherein:

the word data storage stores, for the respective words, spelling data in the
first language, pronunciation data as the first voice data, character data indicating a
meaning in the second language, and meaning voice data corresponding to the
35 character data as the second voice data; and

the word outputter outputs the pronunciation data and the meaning voice
data from the voice outputter in the order, in accordance with the replay mode

selected by the replay mode selector, while displaying the spelling data and the character data on a display in the order.

5. A voice output method in a voice output apparatus including word data memory that stores first voice data in a first language and second voice data in a second language with respect to respective words as voice data, the method comprising:

a replay mode selecting step of selecting one replay mode from among replay modes for replaying the first voice data and the second voice data of the respective words, in response to a user operation; and

a word output step of outputting the first voice data and the second voice data of the respective words as the voice data from a voice outputter in an order in accordance with the replay mode selected in the replay mode selecting step.

6. The voice output method according to claim 5, wherein,

the replay mode selection step includes a step of selecting one replay mode from among replay modes including an automatic replay mode and a manual replay mode, the automatic replay mode being a mode where the first voice data and the second voice data are output in the order automatically switched, the manual replay mode being a mode where the first voice data and the second voice data are output in the order manually switched in response to a user operation.

7. The voice output method according to claim 6, further comprising:

a temporary stopping step of temporarily stopping an output of the voice data in response to a user operation in a state where the first voice data and the second voice data of the respective words are output in the order automatically switched when the automatic replay mode is selected by the replay mode selecting step; and

a word checking step of storing check data in correlation with the respective words in response to a user operation during the temporal stop of the output of the voice data of the respective words by the temporary stopping step.

8. The voice output method according to claim 5, wherein:

the word data memory stores, for the respective words, spelling data in the first language and pronunciation data as the first voice data, character data indicating a meaning of the word in the second language, and meaning voice data corresponding to the character data as the second voice data, and

the word outputting step includes a step of pronunciation data and the meaning voice data from the voice outputter in an order, in accordance with the replay mode selected by the replay mode selecting step, while displaying the spelling data and the character data on a display in the order.