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(54) Portable karaoke device

(57) A portable karaoke device includes a processing unit coupled to a voice input unit and a background sound conversion unit, a sound-effect conversion unit coupled to the processing unit, an addition unit coupled to the sound-effect conversion unit and the voice input unit, and a playback unit coupled to the addition unit. Thereby, a convenient building, plug-and-play, non-setting, and low-cost portable karaoke device can be provided.

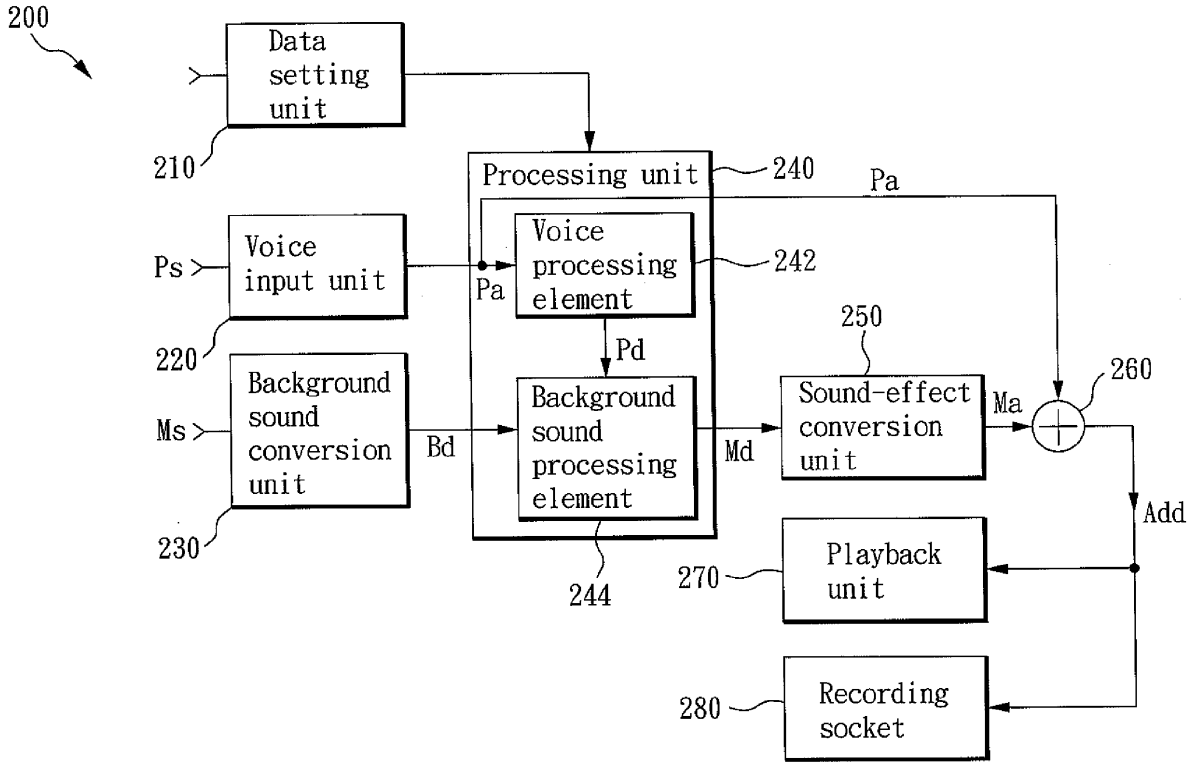

FIG. 1

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a karaoke device, in particular, a plug-and-play and no setting necessary portable karaoke device.

2. Description of Related Art

[0002] In recent years, karaoke devices tend to be smaller in size. Even so, using karaoke devices are often limited by time and space. For instance, in order to sing, the karaoke device must be placed at a fixed location (in a living room or in an indoor saloon) along with complicated sound-effect cable connection and setting. Moreover, additional items such as DVD, CD, cassettes...etc must also be purchased for music content. Even when the music content is built-in, extra payment for purchasing karaoke music is necessary when you wish to store in a large-capacity built-in memory. Often time, the memory capacity is insufficient to store a large number of music, and older music must be deleted to make room for newer songs. This is really troublesome, and greatly reduces willingness of entertainment for modem people.

[0003] In view of the above, this invention is intended to provide a protable karaoke device which is low cost and convenient to build, which will allow users to connect externally to a widely available music player (such as the cell phone or a computer). The songs can then be selected through the player and transmit to the karaoke device for further processing, creating a completely plug-and-play karaoke effect. If a microphone is connected externally, the purpose of karaoke singing songs can be achieved.

SUMMARY OF THE INVENTION

[0004] Conventionally, karaoke devices have to be placed at a fixed location, are difficult to setup, and limited in adding new karaoke music. The present invention, through the microprocessor of a built-in register, all the music-playing preset values (such as song-selection module setting, rising-falling tone setting, records for last-time song selection, and so forth) can be stored. Further, the built-in microprocessor is provided with a Universal Serial Bus (USB) for supplying power to the karaoke device, and that through a USB external processor, the music-playing preset values of the karaoke can be updated.

[0005] It should be noticed that regarding the karaoke music, the present invention connects externally a common player, and selects optionally the songs to be sung from the external player. This not only avoids the necessity of building in a huge-capacity memory for storing karaoke songs, but also updates new karaoke songs from the player anytime so as to achieve an object of convenient building, plug-and-play, and low cost.

[0006] The present invention also achieve another objective in that the karaoke device can connect to a headphone, allowing the user to listen to their voice and not disturb others.

[0007] To achieve the above-mentioned objects, the present invention provides a portable karaoke device comprising a voice input unit for producing a voice analogue signal, a background sound conversion unit for producing background sound digital signal, a processing unit, a sound-effect conversion unit, an addition unit, and a playback unit. The processing unit is coupled to the voice input unit and the background sound conversion unit. The processing unit includes a voice processing element and a background sound processing element, wherein the voice processing element produces a voice digital signal based on the voice analogue signal, and the background sound processing element produces a mix digital signal based on the voice digital signal and the background sound digital signal. The voice processing element is coupled to the background sound processing element.

[0008] According to the present invention, the sound-effect conversion unit is coupled to the background sound processing element of the processing unit so as to produce a mix analogue signal based on the mix digital signal. The addition unit is coupled, respectively, to the sound-effect conversion unit and the voice input unit so as to produce an addition signal by adding up the voice analogue signal and the mix analogue signal. The playback unit is coupled to the addition unit so as to convert the addition signal into a sound signal, and to make a sound through an externally-connected player.

[0009] Further, the novel playback unit, according to the present invention, includes a speaker socket for producing a speaker sound signal format, a headphone jack for producing a headphone sound signal format, and a playback selection element for selecting the speaker sound signal format or the headphone sound signal format. The playback selection element is coupled, respectively, to the speaker socket and the headphone jack. The speaker socket can be connected externally with a speaker, while the headphone jack can be connected externally with a headphone. When the playback selection element detects the externally-connected speaker in connection with the speaker socket, the playback selection element will convert the addition signal into the speaker sound signal format. Similarly, when the playback selection element detects the externally-connected headphone in connection with the headphone jack, the playback selection element will convert the addition signal into the headphone sound signal format so as to make a sound from the headphone.

[0010] The novel portable karaoke device, according to the present invention, may further comprise a recording socket coupled to the addition unit, where the recording socket can produce a recording sound signal format based on the addition signal. Besides, the recording

socket can be connected externally with a recording device for recording the addition signal in the recording device such that a recording purpose can be achieved.

[0011] According to the present invention, the novel portable karaoke device may further comprise a data setting unit for storing a preset value. The data setting unit includes a connection socket for supplying power and revising the preset value. The connection socket relates to a Universal Serial Bus (USB) so as to provide power or to update the preset value of the portable karaoke device through an external processing device. The preset value may be of song-selection module setting, rising-falling tone setting, records for last-time song selection, and so forth.

[0012] Further, according to the present invention, the background sound conversion unit may be connected externally with a background music player for providing background music, such as the music player for a cell phone or the music player for a computer, where the songs to be sung can be selected from the background music player so as to avoid the necessity of a large-capacity built-in memory device for storing the karaoke songs, and to update anytime new karaoke songs from the background music player. Besides, the voice input unit, according to the present invention, can connect externally with a microphone so as to achieve the purpose of singing songs for the portable karaoke device.

[0013] Other objects, advantages, and novel features of the present invention will become more apparent from the following detailed descriptions when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

FIG. 1 is a block diagram illustrating the layout of a portable karaoke device according to a first embodiment of the present invention;

FIG. 2 is a block diagram illustrating the layout of a playback unit according to the first embodiment of the present invention;

FIG. 3 is a schematic view illustrating the karaoke device according to the first embodiment of the present invention; and

FIG. 4 is a schematic view illustrating a portable karaoke device according to a second embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] Referring to FIG. 1, a block diagram illustrating the layout of a portable karaoke device according to a first embodiment of the present invention, the portable karaoke device 200 comprises a data setting unit 210, a voice input unit 220, a background sound conversion unit 230, a processing unit 240, an sound-effect conversion unit 250, an addition unit 260, and a playback unit 270. The voice input unit 220 receives a voice signal Ps, where the voice signal Ps is treated with noise removal and signal amplification so as to produce a voice analogue signal Pa which is then transmitted to the processing unit 240. The background sound conversion unit 230 receives a background sound signal Ms such that the analogue background sound signal Ms is converted into a digital signal, namely the background sound signal Ms is performed with an analogue/digital conversion so as to produce a background sound digital signal Bd then transmitted to the processing unit 240. In the present embodiment, the background sound conversion unit 230 is connected externally with a background music player such that the background sound signal Ms is transmitted to the background sound conversion unit 230 so as to provide the portable karaoke device 200 required background music. Further, the voice input unit 220 is connected externally with a microphone such that the voice signal Ps is transmitted to the voice input unit 220 so as to provide the portable karaoke device 200 a required voice.

[0016] The data setting unit 210 is provided for storing a preset value so as to supply various settings required for the portable karaoke device 200, such as song-selection module setting, rising-falling tone setting, records for last-time song selection, and so forth. Further, the data setting unit 210 has a connection socket so as to supply power, through an external processing device (such as a computer), to drive the portable karaoke device 200, and to update the preset value of the portable karaoke device 200 in the processing device 240. In the present embodiment, the connection socket relates to a Universal Serial Bus (USB).

[0017] The processing unit 240 is coupled to the voice input unit 220 and the background sound conversion unit 230. The processing unit 240 includes a voice processing element 242 and a background sound processing element 244, wherein the voice processing element 242 produces a voice digital signal Pd based on the voice analogue signal Pa. The background sound processing element 244 is coupled to the voice processing element 242 so as to produce a mix digital signal Md based on the voice digital signal Pd and the background sound digital signal Bd. Namely, the background sound digital signal Bd is mixed with the voice digital signal Pd, and after tuning digitally, various background sound effects can be produced, such as Echo. In the present embodiment, the voice processing element 242 relates to an analogue/digital converter for converting the voice analogue signal Pa into a voice digital signal Pd through analogue/digital conversion.

[0018] The sound-effect conversion unit 250 is coupled to the background sound processing element 244 of the processing unit 240 so as to produce a mix analogue signal Ma based on the mix digital signal Md, where the mix analogue signal Ma is then transmitted to the addition unit 260. The addition unit 260 is coupled, respectively,

to the sound-effect conversion unit 250 and the voice input unit 220 so as to produce an addition signal Add by adding up the voice analogue signal Pa and the mix analogue signal Ma. That is to say, to mix the voice analogue signal Pa and the mix analogue signal Ma having a background sound effect, a function of karaoke device can be achieved.

[0019] The playback unit 270 is coupled to the addition unit 260 so as to convert the addition signal Add into a sound signal. Now referring to FIG. 2, a block diagram illustrating a layout of the playback unit 270 according to the first embodiment of the present invention, and also to FIG. 2, the playback unit 270 includes a speaker socket 274, a headphone jack 276, and a playback selection element 272. The speaker socket 274 processes with the addition signal Add so as to produce an addition signal Add of speaker sound signal format. The headphone jack 276 processes with the addition signal Add so as to produce an addition signal Add of headphone sound signal format. The playback selection element 272 is coupled, respectively, to the speaker socket 274 and the headphone jack 276 so as to play a sound signal in selecting an addition signal Add of speaker sound signal format or of headphone sound signal format. In the present embodiment, the speaker socket 274 can be connected externally with a speaker so as to play a sound signal by receiving an addition signal Add matching the speaker sound signal format. Further, the headphone jack 276 can be connected externally with a headphone so as to play a sound signal by receiving an addition signal Add matching the headphone sound signal format. Therefore, through the sound signal played from the headphone, users can self-sing and self-listen, without using the loudening speaker device such will turn out to disturb others.

[0020] According to the present invention, the portable karaoke device 200 further comprises a recording socket 280 coupled to the addition unit 260, where the recording socket 280 can produce a recording sound signal format based on the addition signal Add. In the present embodiment, the recording socket 280 can be connected externally with a recording device for receiving an addition signal Add matching the recording sound signal format and recording the same in the recording device.

[0021] Reference may be made to FIG. 3, a schematic view illustrating the karaoke device according to the first embodiment of the present invention. The following is an example to explain as to how the portable karaoke device 200, according to the present invention, can be used by two users.

[0022] First, users connect the data setting unit 210 externally with a computer so as to provide power to the portable karaoke device 200, and, in the meantime, to set a preset value for the portable karaoke device 200. As such, there is no extra work required to set the portable karaoke device 200 manually.

[0023] Secondary, the users connect the background sound conversion unit 230 externally with a computer so as to select from the computer the karaoke music for singing songs, then, through the background sound conversion unit 230, load in the background sound signal Ms, which represents the karaoke music, to the portable karaoke device 200 for a further karaoke music effect such as echo or tone change.

[0024] Further, the users connect the voice input unit 220 with two microphones such that two users each holds a microphone for singing songs, and load in the voice signals Ps, which represent the user's singing, from each respective voice input unit 220 to the portable karaoke device 200 for a further process.

[0025] Finally, the users connect the playback unit 270 with speakers, and connect the recording socket 280 with the computer, so that the users' singing and the karaoke music can be played out of the speakers through the portable karaoke device 200, and that the music files corresponding thereto can be recorded in the computer, where the music files can be played if required.

[0026] Now referring to FIG. 4, a schematic view illustrating a portable karaoke device 400 according to a second embodiment of the present invention, connecting relations and operating manner of the portable karaoke device 400 are the same as those of the portable karaoke device 200 and the playback unit 270 shown in FIG. 1 and FIG. 2, and have been described above, thus no further redundancy is necessary. However, it should be noticed that, in the present embodiment, a data setting unit 410 is connected, instead, with a common household electric power source as a power supply to the portable karaoke device 400 through a power converter 490. Further, a playback unit 470 is connected, instead, with a headphone such that users can self-sing and self-listen, without using a loudening speaker device to play the users' songs and karaoke music such will cause a problem of disturbance to others.

[0027] Given the above, the portable karaoke device, according to the present invention, can connect externally with a common player, and select the songs to be sung from the player such then are transmitted to the portable karaoke device without the necessity of a large-capacity built-in memory device to store the karaoke songs. Besides, the portable karaoke device, according to the present invention, can connect externally, via a USB connector, with a processing device (such as a computer) for supplying power to the portable karaoke device, where the preset values of the portable karaoke device can be changed in the processing device. This will help achieve a convenient building, plug-and-play, non-setting, and low cost karaoke purpose and effect.

[0028] Although the present invention has been explained in relation to its preferred embodiments, it is to be understood that many other possible modifications and variations can be made without departing from the scope of the invention as hereinafter claimed.

Claims

1. A portable karaoke device, comprising:

   a voice input unit, for producing a voice analogue signal;
   a background sound conversion unit, for producing a background sound digital signal;
   a processing unit, being coupled to the voice input unit and the background sound conversion unit, and including a voice processing element which produces a voice digital signal based on the voice analogue signal and a background sound processing element which produces a mix digital signal based on the voice digital signal and the background sound digital signal, and wherein the voice processing element is coupled to the background sound processing element;
   a sound-effect conversion unit, for producing a mix analogue signal based on the mix digital signal, and being coupled to the background sound processing element of the processing unit;
   an addition unit, for producing an addition signal by adding up the voice analogue signal and the mix analogue signal, and being coupled to the sound-effect conversion unit and the voice input unit; and
   a playback unit, for converting the addition signal into a sound signal, and being coupled to the addition unit.

2. The portable karaoke device as claimed in claim 1, wherein the playback unit includes a speaker socket for producing a speaker sound signal format, a headphone jack for producing a headphone sound signal format, and a playback selection element for selecting the speaker sound signal format or the headphone sound signal format, and wherein the playback selection element is coupled, respectively, to the speaker socket and the headphone jack.

3. The portable karaoke device as claimed in claim 2, wherein the speaker socket is connected externally with a speaker.

4. The portable karaoke device as claimed in claim 2 or 3, wherein the headphone jack is connected externally with a headphone.

5. The portable karaoke device as claimed in claim 1, 2, 3 or 4 further comprising a recording socket for producing a recording sound signal format based on the addition signal, and wherein the recording socket is coupled to the addition unit.

6. The portable karaoke device as claimed in claim 5, wherein the recording socket is connected externally with a recording device.

7. The portable karaoke device as claimed in any preceding claim, further comprising a data setting unit for storing a preset value, wherein the data setting unit includes a connection socket for supplying power and revising the preset value.

8. The portable karaoke device as claimed in claim 7, wherein the connection socket relates to a Universal Serial Bus (USB).

9. The portable karaoke device as claimed in any preceding claim, wherein the background sound conversion unit is connected externally with a background music player for providing background music.

10. The portable karaoke device as claimed in any preceding claim, wherein the voice input unit is connected externally with a microphone.

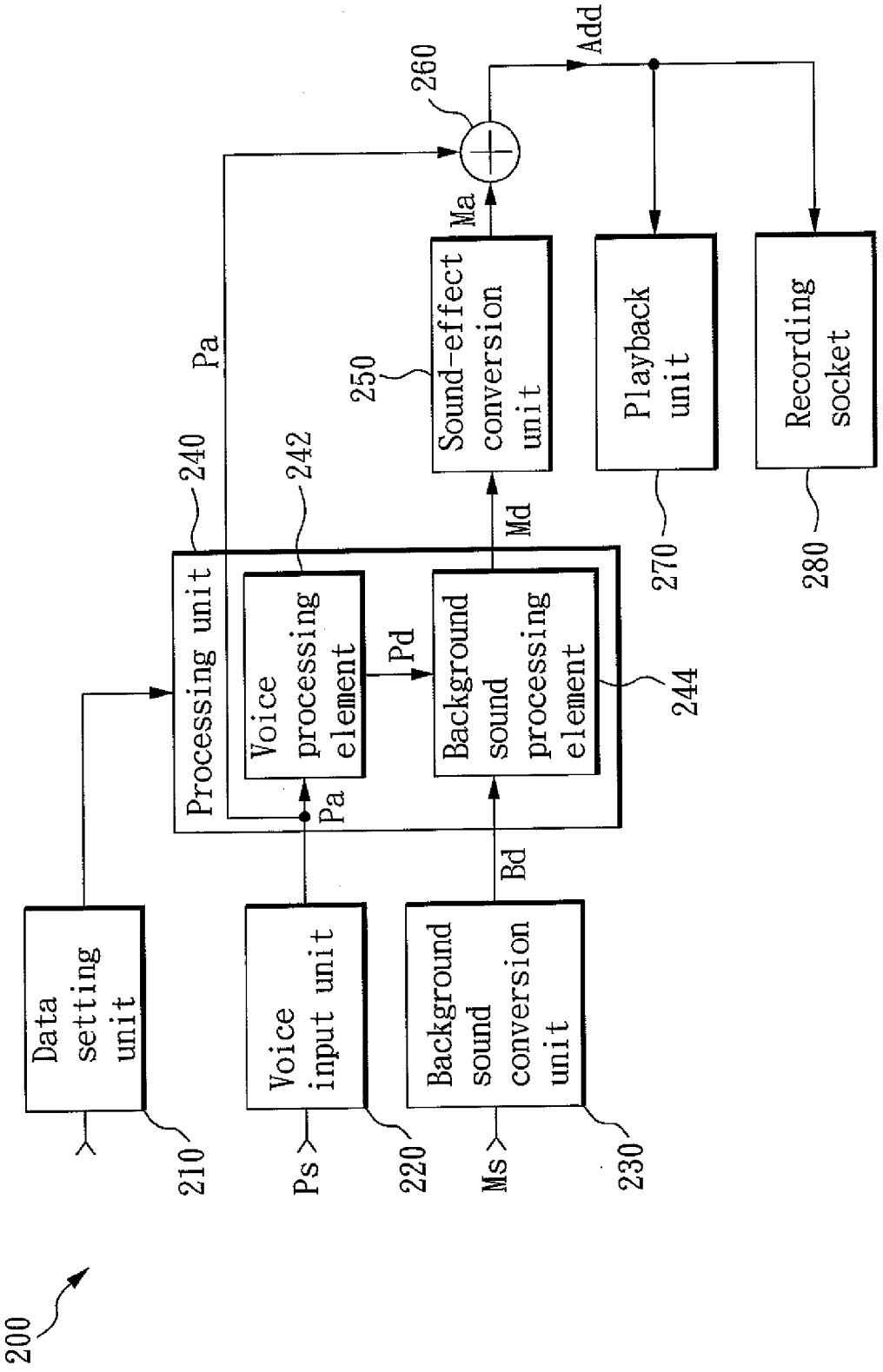
200
Data setting unit
210
Voice input unit
Ps
220
Background sound conversion unit
Ms
230
Bd
Processing unit
240
Voice processing element
242
Pa
Pd
Background sound processing element
244
Md
Sound-effect conversion unit
250
Ma
260
Add
Pa
Playback unit
270
Recording socket
280

FIG. 1

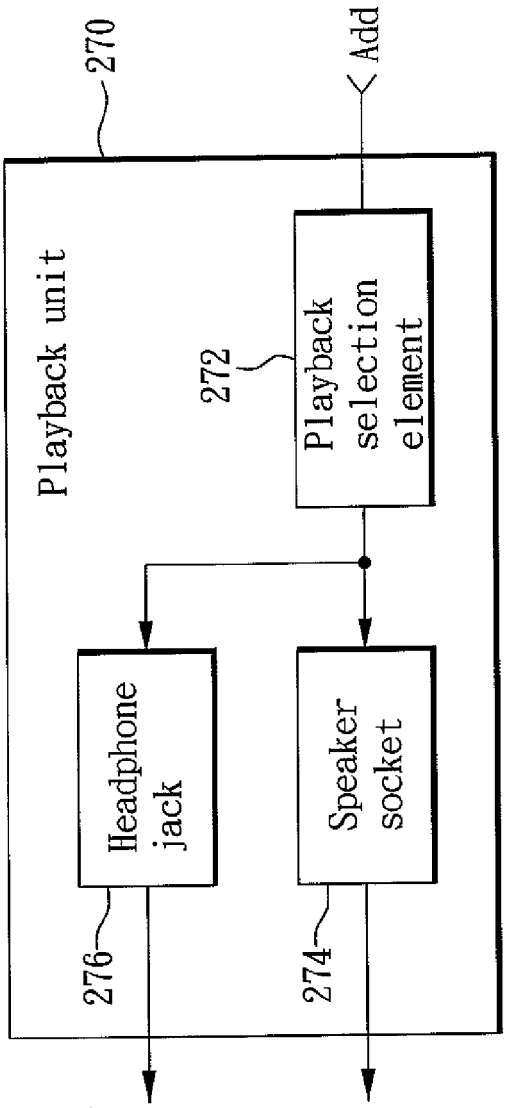
270
Add
Playback unit
272
Playback selection element
Headphone jack
Speaker socket
276
274

FIG. 2

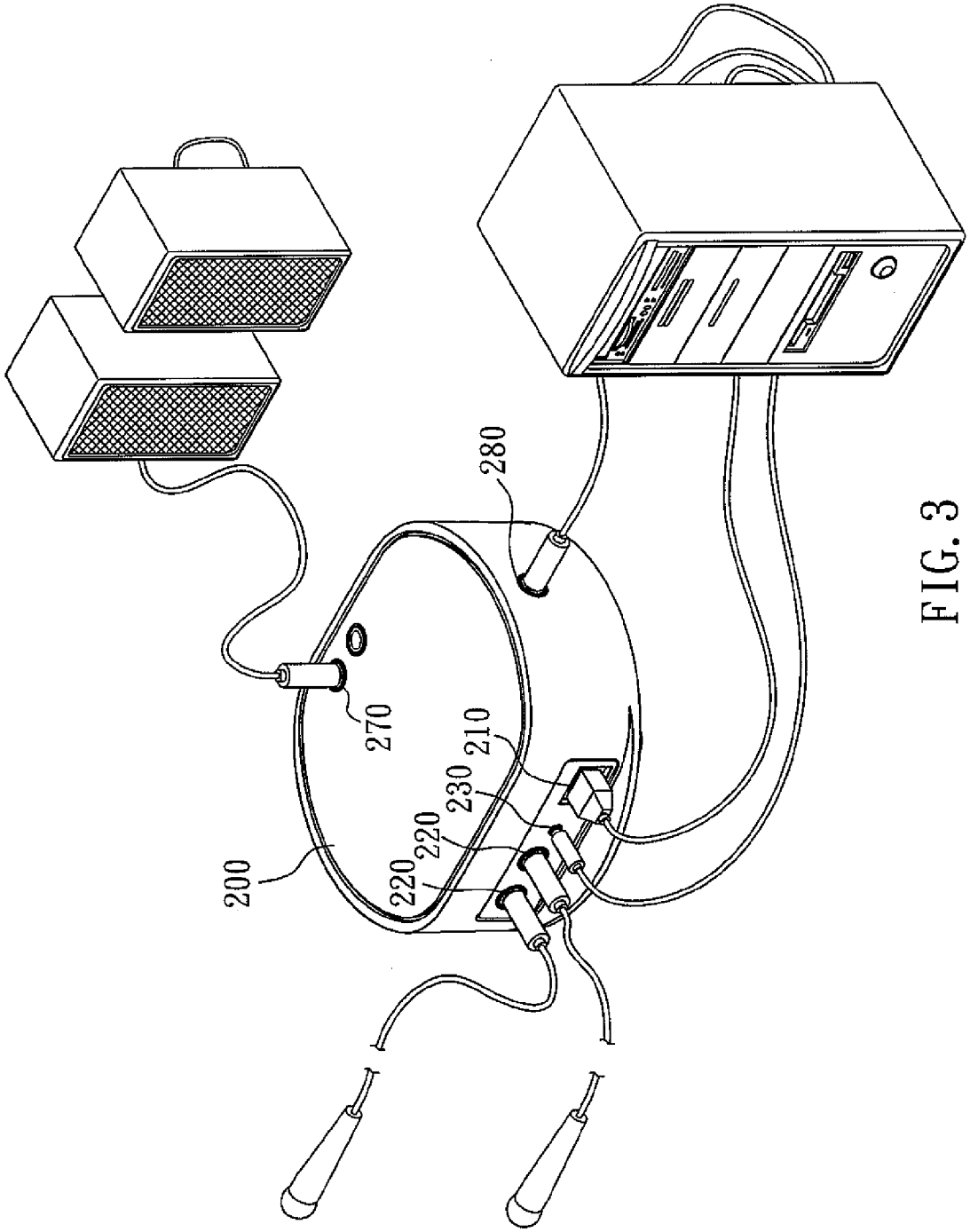

FIG. 3

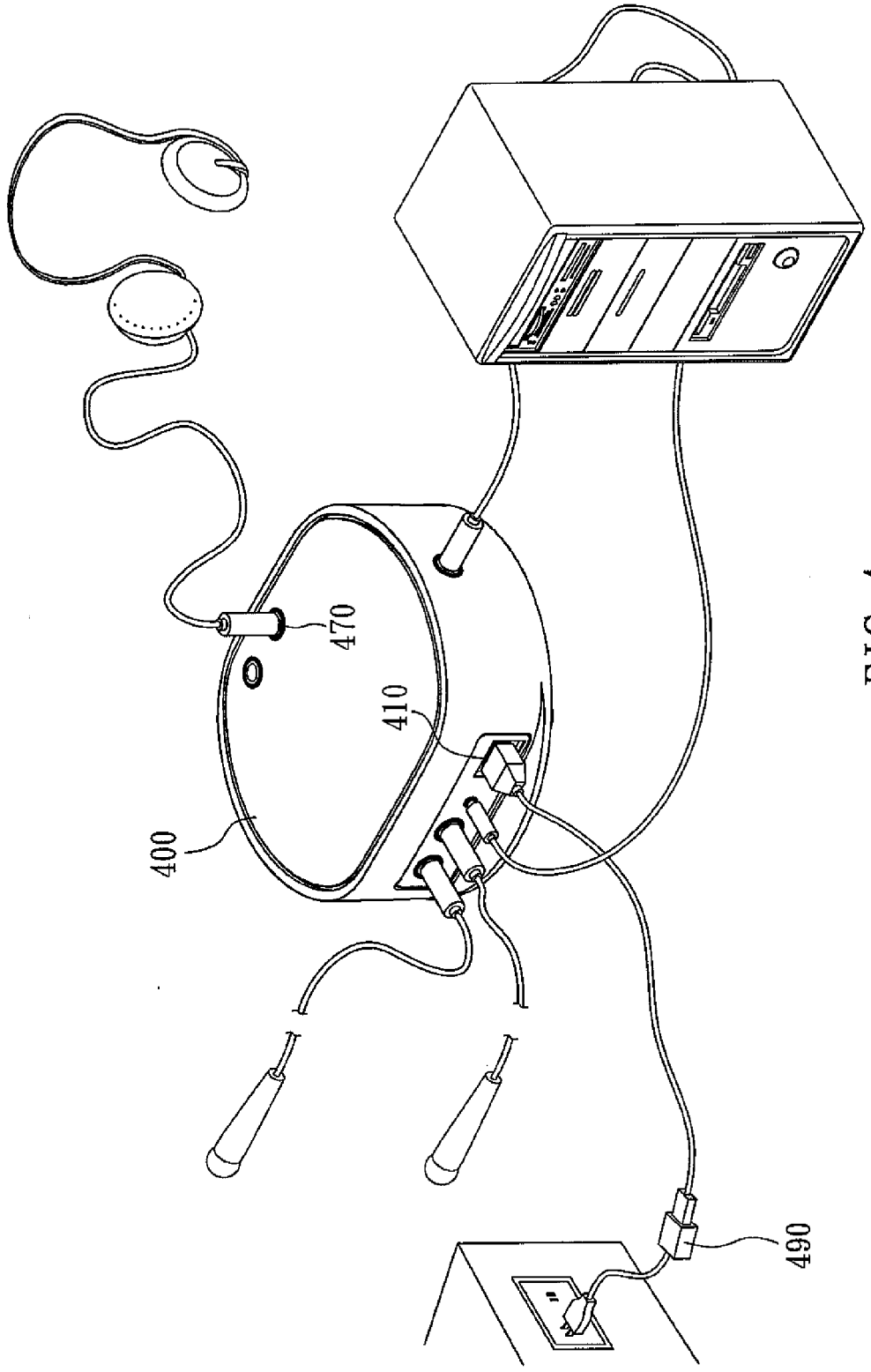

FIG. 4