INTERACTIVE BOOK AND TOY

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ABSTRACT

Interactive book and toy assemblies are described. One embodiment relates to an interactive book and toy device including a book having a plurality of pages with text and pictures thereon. A controller is mounted on the book. The device also includes a toy having a speaker positioned therein. The device also includes a connection mechanism adapted to electrically couple the book to the toy. The connection mechanism is also adapted to physically secure the book to the toy. The controller is adapted to transmit a signal to the speaker in the toy, through the connection mechanism, in response to activation of a switch in the book. Other embodiments are described and claimed.
Fig. 5

Computer

Memory

Operating System

Drivers

Applications

Processor

Device

Device

Device

Device

BIOS
INTERACTIVE BOOK AND TOY

RELATED ART

[0001] A variety of combination book and toy devices that produce audible sounds in response to user interaction are known in the art. Such devices typically include electronic component such as controllers, speakers and power supplies. Some types of devices include a toy having switches thereon that correspond to pages of an accompanying book. When a switch on the toy is pressed, the text of a corresponding page of the book is played through a speaker. Other devices include a pointer containing electrical components therein, that may be used to control the sound generation. The placement and actuation of the various components may lead to disadvantages relating to size, appearance, manufacturing and convenience of use of the book and toy device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0002] Embodiments are described by way of example, with reference to the accompanying drawings, which are not necessarily drawn to scale, where:

[0003] FIG. 1 is a perspective view of a toy and interactive book coupled together, in accordance with certain embodiments of the present invention;
[0004] FIG. 2 is a perspective view of a toy and interactive book, with the front cover of the book detached from the toy, in accordance with certain embodiments of the present invention;
[0005] FIG. 3 is a cut-away view of a toy, illustrating certain components therein, such as batteries and a speaker, in accordance with certain embodiments of the present invention; and
[0006] FIG. 4 is a perspective view illustrating pages open in an interactive book, in accordance with certain embodiments of the present invention.

[0007] FIG. 5 illustrates a computing environment which may be used in accordance with certain embodiments of the present invention.

DETAILED DESCRIPTION

[0008] In the following description, reference is made to the accompanying drawings which form a part hereof and which illustrate several embodiments. It is understood that other embodiments may be utilized and structural and operational changes may be made without departing from the scope of the descriptions provided.

[0009] FIGS. 1-4 illustrate a combination toy and interactive book device 20 in accordance with certain preferred embodiments. The device 20 includes a toy 12 and book 20. Recordings relating to a story may be played by a speaker in the toy 12, in response to a user’s interaction with the book 20 such as, for example, touching certain regions on pages of the book 20.

[0010] The toy 12 may in certain embodiments be a plush animal such as the rabbit illustrated in FIGS. 1-3. It is appreciated that the toy 12 may take any form including human and other animal shapes. It is further appreciated that the toy 12 may have the overall shape of other objects such as trees and flowers and inanimate objects, as well as entirely fanciful shapes. The book 20 may be a conventional book such as a story book with words, pictures, and the like on one or more pages. The book 20 illustrated in FIG. 1 is open and one or more text regions 21 and artwork regions 23 are shown on the pages. In certain embodiments, the book includes a front cover 22 and back cover 24, with the pages bound at a spine 29.

[0011] FIG. 2 shows the book 20 being partially closed. The book 20 may be coupled to the toy 12 using a variety of suitable connection mechanisms. In certain preferred embodiments, the connection is adapted to electrically couple the book 20 to the toy 12 and to also physically secure the book 20 to the toy 12. For example, in certain embodiments, snap connections may be used to removably couple the book 20 and toy 12. The snap connections are configured to provide both an electrical connection between the toy 12 and book 20 and to physically secure the book 20 to the toy 12. The snap connections also permit the book 20 to be separated from the toy 12 and a different book can be attached to the toy or a different toy can be attached to the book.

[0012] The book 20 of the embodiment illustrated in FIG. 2 also includes a controller 25 coupled to the front cover 22 for controlling the output of a speaker in response to user actions. Alternatively, the controller 25 may be located elsewhere in the book, for example, connected to the back cover 24. The controller 25 may in certain embodiments include a processor and memory containing the desired output related to the story of the book 20, to be transmitted to the speaker in response to signals from the various interactive regions of the book 20.

[0013] FIG. 3 illustrates a cut-away view of a portion of the toy 12 showing several components therein, including a power supply 30 and speaker 32 housed in an interior portion (for example, the inside of the torso) of the toy 12. The power supply 30 is adapted to contain one or more batteries. In an alternative embodiment, power may be supplied through a power jack that can be plugged into a wall socket to obtain power. By housing potentially bulky components, such as the power supply 30 and speaker 32, within the toy 12, and by housing the controller 25 within the book 20, such embodiments permit the weight and bulkiness of the book to be decreased, and permit the use of different books with the same toy 12.

[0014] The embodiment illustrated in FIGS. 2-3 includes a snap connector that includes a male connector side 40a on a first arm or hand region of the toy 12, for connection to one pole of the power supply 30, and a male connection side 41a on the first arm or hand region of the toy 12, for connection to a second pole of the power supply 30, through wiring 34. A front cover 22 of the book 20 includes female connection sides 40b and 41b, for coupling to the male connection sides 40a and 41a.

[0015] As illustrated in FIG. 3, snap connections are also made between a second arm or head region of the toy 12 and the back cover 24 of the book 20, with female connector side 42b connected to a first pole of the speaker 32 in the toy 20, and female connector side 43b connected to a second pole of the speaker 32, through wiring 35. The male connector sides (not shown in FIG. 3) that couple to the female connector sides 42b and 43b are positioned on the back cover 24 of the book 20.
By making the connector sides on the front cover 22 of the book female and the connector sides on the back cover 24 male, the proper orientation of the book on the toy (not upside down) is easily obtained. In alternative embodiments, the connector sides could be reversed, or the same types of connector sides could be used on both covers of the book. Different numbers of connectors and/or different connector types may also be used in other embodiments. Embodiments may also include an on/off switch 31, if desired, which may be positioned on the toy 12 (for example, on a surface of the toy 12 adjacent to the power supply 30 or speaker 32) or on the book 20, if desired.

FIG. 4 illustrates an example of two pages of the book 20 including text 21 and pictures 23 printed thereon. The pages also each include a plurality of interactive book hot spots 50a-50h thereon, set forth in dotted lines at various positions on the pages and overlapping at least portions of the text 21 and/or drawings 23. When pressure such as that generated by pressing a finger is applied to the hot spots 50a-50h, an electrical audio signal is generated by the controller 25 and sent to the speaker 32 in the toy 12. The pages also include page identification hot spots 60a-60f, positioned at various locations along the bottom of the pages. The application of force to these hot spots 90a-90f transmits a signal to the controller 25 indicating which page the user is on. The hot spot for the page the user is on may be positioned to surround a printed page number or other symbol 64 on the page. Thus, when a user opens to a page and presses on the page number hot spot (such as hot spot 60a), the controller 25 can then discern the relevant audio content to transmit through the speaker 32 pertaining to the various hot spots on the identified page. Thus, the same switch 26, may be used to identify user interaction on more than one page. The various hot spots may be positioned at other locations on the pages, if desired, and additional page number hot spot locations may be present in certain embodiments.

In certain embodiments, the front cover 22 and back cover 24 of the book 20 each contains pressure sensitive switches that are actuated by applying pressure to the various hot spots on the pages. A variety of switches may be used. For example, the switches may be formed of a suitable conductive ink matrix set, each set comprising electrically conductive ink printed on two membranes of flexible material, such as plastic sheet. Corresponding conductive areas of the conductive ink membrane pair are held in close proximity to each other with an insulation membrane interspersed between the conductive ink membranes, the insulation membrane providing means for maintaining a non-conductive gap between the conductive ink membrane pair while reading and turning pages, and allowing the conductive ink membrane pair to contact each other when finger pressure is applied to a hot spot on a page of the book. For example, as illustrated in FIG. 2, switch 26 is positioned in the cover 22. The switch 26 may include conductive ink membrane pair as described above. When a hot spot region on one of the pages in the book 20 is pressed, the pressure will force the conductive ink membrane pair in the switch 26 together and send a signal to the controller 25. The switch 26 may include conductive ink leads that may be terminated along or close to an edge of the cover 22 where they are electrically connected to terminals of the controller 25 via soldered copper wire 27, or by another suitable method.

The hot spots 50a-50h and 60a-60f illustrated in FIG. 4 are pressable areas, such as text 21 or artwork 23, on successive pages of the book 20, which are formed from a sufficiently rigid material to permit pressure on a page to pass through successive pages onto a switch which in preferred embodiments is a pressure switch such as the switch 26 described above, within the front cover 22 or the back cover 24. In certain embodiments, front cover 22 of the book 20 include hot spot switches for all odd numbered pages, with the inside of the front cover 22 being identified as page one. In such embodiments, the switches housed within the back cover provide hot spot switches for all even numbered pages. The switch locations in the front cover 22 and back cover 24 may be selected to be unique to hot spots on each page, so that the user can identify to the controller 25 the current page being read by pressing the appropriate page hot spot. For example, switch 36 (FIG. 2) is positioned to be actuated when page number hot spot 60a (FIG. 4) is pressed. The switch 36 may in certain embodiments be a pressure switch having a structure similar to that described above. In certain embodiments, the switch 36 may be electrically connected to the controller 25 in a similar manner as the switch 26. By knowing the page number, during subsequent pressing of other hot spots (for example, hot spots 50a-50h) on the page, the controller 25 can send the appropriate information to the speaker 32. In such embodiments, entering the page number information into the controller 25 prior to pressing the other (non-page number) hot spots on the page eliminates the need to include switches and wiring for automatically detecting current page status. It should be appreciated that a variety of suitable switch designs may be used and that in alternative embodiments, automatic detection of aspects such as the page number may be desirable.

For example, in certain alternative embodiments, a separate magnetic switch sensor system may be used for sensing certain aspects such as the page being accessed by the user. For example, by embedding magnets at different locations on different pages, magnetic sensors positioned in the front cover and back cover may sense as each page is turned and send a signal to the controller, which may in turn then send the appropriate signal to the speaker when hot spots such as text or artwork hotspots on the page are pressed. For example, the switch 39 illustrated in FIG. 2 could be a magnetic switch. In such an embodiment, the hot spot location 60a may include a magnet or a magnetic material, including, but not limited to, certain steels, in order to actuate the switch 29 when the page is turned.

FIG. 5 illustrates one example of a computing environment which may be used with the described embodiments. In this embodiment, the controller device 25 may include a processor 104 (such as one or more central processing units (CPU)), a basic input/output system (BIOS) 106 including code executed by the processor 104 to initialize and control various computer 102 components (e.g., input sensor circuits, and music and speech synthesizer output circuits) during a boot sequence. In alternative embodiments, the computer components may include a keyboard, display screen, disk drives, serial communications, etc.) The computer 102 includes a memory 108, comprising one or more volatile memory devices, such as volatile random access memory (RAM), in which an operating system 110, an application 111, and one or more drivers 112, such as a device driver interfacing with an
attached device 114a, 114b . . . 114m, are loaded into the memory 208 implementing a runtime environment. In some applications, the memory 108 may further include nonvolatile memory (e.g., a flash memory, Electronically Erasable Programmable Memory (EEPROM), optical disk drives, magnetic disk drives etc.) for storing data such as application data, story part data, speech data and music data. The nonvolatile memory may in one embodiment, be removable or updateable to permit substitute application data, story part data, speech data or music data to be provided to the computer 102.

[0022] Each device 114a, 114b, . . . 114m may comprise any type of Input/Output (I/O) device, such as the input sensors from the hot spot switches (such as switch 26), music and speech synthesizer circuits, etc. In other embodiments, the devices 114a, 114b, . . . 114m may comprise a hard disk drive, a chipset, or a chip, for example which may be integrated on the computer 102 motherboard or on an expansion card inserted in an expansion slot on the computer 102 motherboard. A BIOS 106 may be implemented in firmware in a non-volatile memory device on the computer 102 motherboard, such as a Flash memory, Read Only Memory (ROM), Programmable ROM (PROM), etc. The BIOS 106 code indicates the sequence of the boot operations. The operating system 110 may comprise a suitable operating system, such as a Microsoft® Windows® operating system, Linux™, Apple® Macintosh®, etc. (Microsoft and Windows are registered trademarks of Microsoft Corporation, Apple and Macintosh are registered trademarks of Apple Computer, Inc., and Linux is a trademark of Linus Torvalds). It is appreciated that the controller 25 may comprise any computing device known in the art, and any suitable CPU or processor 104 or operating system may be used.

[0023] The described operations of the computer may be implemented as a method, apparatus or article of manufacture using standard programming and/or engineering techniques to produce software, firmware, hardware, or any combination thereof. The term “article of manufacture” as used herein refers to code or logic implemented in a tangible medium, where such tangible medium may comprise hardware logic (e.g., an integrated circuit chip, Programmable Gate Array (PGA), Application Specific Integrated Circuit (ASIC), etc.) or a computer readable medium, such as magnetic storage medium (e.g., hard disk drives, floppy disks, tape, etc.), optical storage (CD-ROMs, optical disks, etc.), volatile and non-volatile memory devices (e.g., EEPROMs, ROMs, PROMs, RAMs, DRAMs, SRAMs, firmware, programmable logic, etc.). Code in the computer readable medium may be accessed and executed by a processor. The tangible medium in which the code or logic is encoded may also comprise transmission signals propagating through space or a transmission media, such as an optical fiber, copper wire, etc. The transmission signal in which the code or logic is encoded may further comprise a wireless signal. Additionally, the “article of manufacture” may comprise a combination of hardware and software components in which the code is embodied, processed, and executed. Of course, those skilled in the art will recognize that many modifications may be made to this configuration without departing from the scope of the present description, and that the article of manufacture may comprise any suitable information bearing medium.

[0024] The foregoing description of various embodiments has been presented for the purposes of illustration. It is not intended to be exhaustive or to limit to the precise form disclosed. Many modifications and variations are possible in light of the above teachings.

What is claimed:
1. A device comprising:
   a book including a plurality of pages having text and pictures thereon;
   a controller mounted on the book;
   a toy including a speaker positioned therein;
   a connection mechanism adapted to electrically couple the book to the toy, the connection mechanism also adapted to physically secure the book to the toy; and
   wherein the controller is adapted to transmit a signal to the speaker in the toy, through the connection mechanism, in response to activation of at least one switch in the book.
2. A device according to claim 1:
   wherein the switch is adapted to be activated by the application of a sufficient pressure to a location on a page that includes at least one of the text and pictures;
   wherein the controller includes memory;
   wherein in response to activation of the switch, the controller accesses information from the memory, the information related to the at least one of the text and pictures at the location on the page; and
   wherein the signal directs the speaker to play at least one of speech and music related to the information.
3. A device according to claim 1, further comprising a power supply positioned in the toy.
4. A device according to claim 1, wherein the book further includes a front cover and a back cover, the device further comprising a plurality of pressure switches positioned in the front cover and in the back cover.
5. A device according to claim 1, wherein the connection mechanism comprises a plurality of snap connectors, each snap connector including a male shaped portion and a female shaped portion.
6. A device according to claim 5, wherein the connection mechanism includes two snap connectors coupling the toy and front cover, and two snap connectors coupling the toy and back cover.
7. A device according to claim 6, wherein one of the front cover and the back cover includes two male portions of the snap connectors, and the other of the front cover and the back cover includes two female portions of the snap connectors.
8. A device according to claim 4, wherein the toy comprises an animal shape having arms and legs, and wherein the connection mechanism is attached to the arms.
9. A device according to claim 1, wherein the connection mechanism is adapted to permit repeated connection and disconnection of the book and toy.
10. A device comprising:
   a book including front and back covers and a plurality of pages including text and pictures relating to a story;
a plurality of switches in each of the front and back covers, wherein the switches are activated by the application of a sufficient pressure to various locations on the pages;

a controller mounted on the book;
a toy in the form of an animal;
a speaker positioned within the toy;
a power supply positioned within the toy;
a connection mechanism adapted to electrically couple the book to the toy, the connection also adapted to physically secure the book to the toy; and

wherein the controller is adapted to transmit a signal to the speaker in the toy, through the connection, in response to activation of one or more of the switches.

11. A device according to claim 10:

wherein the controller includes memory;

wherein in response to activation of one of the switches, the controller accesses information in the memory, the information related to the at least one of the text and pictures at the location on the page wherein sufficient pressure was applied; and

wherein the signal directs the speaker to play at least one of speech and music related to the information.

12. A device according to claim 10, wherein the connection mechanism comprises a plurality of snap connectors, each snap connector including a male shaped portion and a female shaped portion.

13. A device according to claim 12, wherein the connection mechanism includes two snap connectors coupling the toy and front cover, and two snap connectors coupling the toy and back cover.

14. A device according to claim 13, wherein one of the front cover and the back cover includes two male portions of the snap connectors, and the other of the front cover and the back cover includes two female portions of the snap connectors.

15. A device according to claim 13, further comprising a plurality of additional switches, the additional switches being magnetically activated switches, wherein the additional switches are adapted to transmit a signal to the controller when the pages are turned.

16. A method comprising:

physically securing a book to a toy through a connection mechanism comprising a first portion connected to the toy and a second portion connected to the book;

applying power to a controller on the book, the power being transmitted through a first portion of the connection mechanism;

applying pressure to a position on a page in the book and transmitting an input signal to the controller on the book in response to the pressure applied to the position on the page in the book; and

generating an output signal in the controller on the book in response to the input signal, and delivering the output signal through a second portion of the connection mechanism to a speaker positioned in the toy.

17. A method according to claim 16:

wherein the page in the book includes at least one of text and pictures relating to a story;

wherein the controller includes memory;

wherein the generating an output signal in the controller comprises accessing information related to the story from the memory, the information related to the at least one of text and pictures at the position on the page where the pressure was applied; and

wherein the output signal directs the speaker to play at least one of speech and music related to the information.

18. A method according to claim 16, further comprising using a plurality of snap connectors as the connection mechanism and coupling a first portion of each of the snap connectors to the toy and a second portion of each of the snap connectors to the book.

19. A method according to claim 16, further comprising removing the book from the toy and positioning another book on the toy.

20. A method according to claim 16, further comprising sensing a page turn in the book using a magnetic sensor positioned in the book.

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