

A RESPONSIVE BOOK SYSTEM AND METHOD

THEREFOR

5 **Field of the Invention**

The present invention relates to the field of storybooks. More particularly, the present invention relates to the field of responsive book systems.

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Background of the Invention

A book is used for obtaining information from a visual source. A tape or a screen is used for obtaining information from a vocal or multimedia source.

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Although multimedia sources are advantaged for their multimedia representations, books are still preferred due to their physical presentation.

Prior art techniques include attachment of cassettes, DVDs or software to a book.

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US Patent No. 5,897,324, and US 5,466,158 are considered by the applicant as the closest prior art.

It is an object of the present invention to provide a
25 responsive book system, which overcomes the obstacles and drawbacks of the prior art.

Other objects and advantages of the invention will become apparent as the description proceeds.

Summary of the Invention

In one aspect, the present invention is directed to a responsive book system comprising:

- a book comprising a detecting system, for detecting a current page from a plurality of detectable pages of the book (i.e., for detecting the opened page);
- a storage, for storing content associated with each of the detectable pages; and
- one or more remote responders, for playing and/or displaying the content associated with the current page.

Each of the remote responders may be is embedded in a doll, a display, or another object.

According to one embodiment of the invention, the book further comprises a transmitter, for transmitting to the remote responders a signal indicating the current page; and each of the remote responders comprises a receiver, for receiving the signal.

According to one embodiment of the invention, the transmitted signal indicates the current page, thereby allowing each of the responders to display the content associated with the current page.

According to another embodiment of the invention, the

signal itself comprises the content.

The transmitter may comprise a stereo-transmitter using a single standard stereo channel, and each sub-channel
5 thereof transmitting a different response to each of the remote responders.

The responsive book system may further comprise a recorder, for recording new content to be associated with the
10 detectable pages.

According to one embodiment of the invention, the detecting system comprises:

- distinctive zones on the cross-sectional area of the book,
15 each distinctive zone associated with one of the plurality of pages;
- a detectable mark on each of the plurality of pages, each of the detectable marks located in the distinctive zone thereof, for providing the association; and
- 20 - detectors for detecting the detectable marks.

According to a preferred embodiment of the invention, the detectable mark is invisible.

25 In embodiments of the present invention, the detectable mark comprises a first magnet.

Each of the detectors may comprise a resonance circuit in the distinctive zone in the binding of the book, for detecting
30 the first magnet, for detecting the current page.

The detecting system may further comprise at least a second magnet located in the distinctive zone on at least one page between the first magnet and the resonance circuit, the
5 second magnet for increasing the detectability of the first magnet.

Each of the detectable marks may comprise an electrical contact, for closing and opening an electrical circuit between
10 the electrical contacts of adjacent pages, upon leafing of each of the current pages.

In another aspect, the present invention is directed to a method for making a book respond, said method comprising
15 the steps of:

- detecting the current page in a book from a plurality of pages; and
- playing and/or displaying, by a remote responder, content associated with the current page.

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The method may further comprise the steps of:

- transmitting a signal from the book for indicating the current page; and
- receiving the signal from the book, for providing the
25 response.

According to one embodiment of the invention, the transmitting is carried out by a stereo transmission, each stereo channel thereof transmitting content or indication of
30 content associated with a different remote responder.

The method may further comprise the step of recording the content.

5 According to one embodiment of the invention, the detecting step comprises influencing a resonance circuit by a magnet located on a page.

10 In embodiments of the present invention, the detecting step comprises closing or opening an electric circuit upon leafing using electric contacts on the pages.

The responding may comprise recording, reading, moving.

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The forgoing embodiments of the invention have been described and illustrated in conjunction with systems and methods thereof, which are meant to be merely illustrative, and not limiting.

Brief Description of the Drawings

Embodiments and features of the present invention are described herein in conjunction with the following drawings:

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FIG. 1 is a view of the responsive book system, according to one embodiment of the present invention.

10 FIG. 2 is a view of the responsive book system, according to another embodiment of the present invention.

FIG. 3 is an illustration of the components of the book of the responsive book system, according to one embodiment of the present invention.

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FIG. 4 is an illustration of a circuit of a sensor for sensing the magnetic field of a page of the storybook, according to one embodiment of the present invention.

20 FIG. 5 is an illustration of the components of the book of the responsive book system, according to another embodiment of the present invention.

25 FIG. 6 is an illustration of the components of the book of the responsive book system, according to another embodiment of the present invention.

FIG. 7 is an electrical circuit chart including the three circuits of the example of FIG. 6.

It should be understood that the drawings are not necessarily drawn to scale.

Detailed Description of Preferred Embodiments

The present invention will be understood from the following detailed description of preferred embodiments, which
5 are meant to be descriptive and not limiting. For the sake of brevity, some well-known methods, systems, procedures, components, circuits, and so on, have not been described in detail.

10 FIG. 1 is a view of the responsive book system, according to one embodiment of the present invention.

According to this embodiment of the invention, the responsive book system 10 includes a book 14 and a doll 12 or
15 another remote responder responding to a signal 48. The signal provides information about current page 16 of book 14, which may be produced upon turning to or from or during that page.

20 Doll 12 includes a receiver 26 for receiving signals from book 14, a processing unit 24 for selecting a presentation associated with the current page; an input/output unit 22, such as a loudspeaker, and so on.

25 Receiver 26 receives signal 48 from book 14. The signal may be a wireless signal, transmitted using a wireless transmitter 38 in book 14, or may be wired signal.

Signal 48 may inform processing unit 24 of the current selected book, and the processing unit selects the response, which is appropriate to the current page 16 by retrieving the appropriate file from storage 34.

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According to another embodiment book 14 may include storage 34, such that signal 48 transmitted by book 14 may already include the file. This topology provides that book 14 includes all of the information, and may thus may be replaced
10 by another book 14 performing similar functions.

Input/output unit 22 may be a motor 52, such that the response of doll 12 may be motional, such as a raised hand 54.

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A typical application of responsive book system 10 is for children listening to their mother tell a bedtime story. Upon turning page 16, doll 12 may say, sing, or dance appropriately to the page read.

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Input/output unit 22 of remote responder 12 may be a recorder for vocal or video recording or include other signaling functions which depend on the current page of book 14.

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For example, system 10 may include a recording mode and a reading mode. By selecting the recording mode, responsive book system 10 may record the section of the story read by the mother to storage 34 and associate that section with the detected page 16; then by selecting the reading mode, responsive book system 10 may retrieve from storage 34 and

read the section of the story associated with detected page 16,
to the child.

Responsive book system 10 may include a plurality of
5 dolls 12, each responding typically to the current page 16,
each, however, responding in a different manner.

For two dolls 12, transmitter 38 may use a single
standard stereo channel, each of sub-channels 48a and 48b
10 thereof for one doll 12.

FIG. 2 is a view of the responsive book system, according
to another embodiment of the present invention.

15 Doll 12 may be any physical object (e.g. a can) or a
display 30 which may include an image 32 of a doll.
Multimedia features of display 30 may replace loudspeaker 22
and motor 52.

20 FIG. 3 is an illustration of the components of the book of
the responsive book system, according to one embodiment of
the present invention.

Book 14 includes a detecting system 84, for detecting the
25 current page 16, which is based on a distinctive zone on the
cross-sectional area of book 14 for each page 16.

The binding 20 of book 14 includes a battery 40 for
supplying power, a transmitter 38 for transmitting signals 48
30 to doll 12, and an array of sensors, such as sensors 36 and 42,

each at a different location on binding 20, each location associated to one page.

Each of pages 16 to be detected includes a detectable
5 mark, such as mark 44a for page 16a and mark 18c for page 16c, each mark located above the associated sensor thereof.

According to one embodiment, the detectable mark
comprises a magnet. The magnet may be hidden within the
10 page, thus being invisible.

For example, in the cross-sectional area of book 14, the
distinctive zone of page 16a is the zone of magnet 44a, and
thus binding 20 includes sensor 42 in that zone for detecting
15 page 16a.

The cross-sectional area of page 16a includes a magnet
44a located above sensor 42 thereof, and page 16c includes a
magnet 18c located above sensor 36 thereof.
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According to this example, sensor 42 senses page 16a by
sensing the change of the magnetic field, since magnet 44a on
page 16a changes the distance thereof to sensor 42 from a
range of millimeters, producing a strong magnetic field upon
25 laying page 16a, to several centimeters upon turning of page 16a.

Magnet 44a and other magnets of book 14 preferably are
invisible, being inserted within the paper of each of pages 16.
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FIG. 4 is an illustration of a circuit of a sensor for sensing the magnetic field of a page of the storybook, according to one embodiment of the present invention.

5 Each of sensors 36 and 42 may include a resonance circuit 82, which may be based on a Resistor, Inductor and Capacitor (RLC) circuit forming a harmonic oscillator. Magnet 18c influences the circuit, thus circuit 36 detects magnet 18c, changing the voltage output V_{out} , which is amplified by
10 amplifier A to be an input to transmitter 38.

FIG. 5 is an illustration of the components of the book of the responsive book system, according to another embodiment of the present invention.

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FIG. 5 is similar to FIG. 3, except for the addition of magnet 18a in page 16a, and magnet 18b in page 16b, which improve detection of magnet 18c of page 16c.

20 Magnet 18a in page 16a, magnet 18b in page 16c and magnet 18c accumulate the magnetic field to sensor 36, such that the existence of magnet 18c on page 16c at its prone position on binding 20 is sensible, even for a thick book.

25 FIG. 6 is an illustration of the components of the book of the responsive book system, according to another embodiment of the present invention.

30 According to this embodiment, the detectable marks 44a and 18c comprise electrical contacts.

Each of pages 16a, 16b and 16c and also binding 20 include an array of electrical conductive coated squares, closing – together – electrical circuits, as a function of the
5 current page.

The example of FIG. 6 depicts three electrical circuits, the first having a load R1 for detecting page 16a, the second having a load R2 for detecting page 16b, and a third having a
10 load R3 for detecting page 16c.

Each of loads R1, R2 and R3 represents a sensor for that page, for example, the current through load R3 represents sensor 36 detecting page 16c.
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FIG. 7 is an electrical circuit chart including the three circuits of the example of FIG. 6.

Page 16a connects square 50 of binding 20 to square 58 of page 16a, and square 64 of page 16a to square 56 of binding
20 20, thus closing the circuit of load R1.

Page 16a connects square 50 of binding 20 to square 58 of page 16a, and square 62 of page 16a to square 54 of binding
25 20; page 16b connects square 58 of page 16a to square 66 of page 16b, and square 70 of page 16b to square 62 of page 16a, thus closing the circuit of load R2.

Page 16a connects square 50 of binding 20 to square 58 of page 16a, and square 60 of page 16a to square 52 of binding
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20; page 16b connects square 58 of page 16a to square 66 of
page 16b, and square 68 of page 16b to square 60 of page 16a;
page 16c connects square 66 of page 16b to square 74 of page
16c, and square 76 of page 16c to square 68 of page 16b, thus
5 closing the circuit of load R3.

Transmitter 38 transmits the appropriate signal of page
16c upon current across load R3; or transmits the appropriate
signal of page 16c upon current across load R2, subject to no
10 current being across R3; or transmits the appropriate signal of
page 16a, upon current across load R1, subject to no current
being across R2 ; and so forth.

Additional conductive squares may be spread on the
15 cross-sectional area formed by conductive printing. The
circuits formed by the pages may be organized by a binary or
other logic providing enough combinations for each of the
pages of book 14.

20 In the figures and/or description herein, the following
reference numerals have been mentioned:

- numeral 10 denotes a responsive book system according to
one embodiment of the present invention;
- 25 - numeral 12 denotes a doll, as an example of a remote
responder, which responds to leafing of a page of the book;
- numeral 14 denotes a book;
- numerals 16, 16a, 16b, and 16c denote pages of the book;
- numeral 18c denotes a mark on one of the pages for
30 detecting that page, and also a magnet which functions as

that mark;

- numerals 18a and 18b denote magnets on other pages located in front of 18c, for improving the detection of mark 18c;
- 5 - numeral 20 denotes the binding of the book;
- numeral 22 denotes the input/output unit of the remote responder; it may be a loudspeaker as an output unit;
- numeral 24 denotes a processing unit;
- numeral 26 denotes a receiver;
- 10 - numeral 28 denotes a control box for communication between the book and a standard display;
- numeral 30 denotes a display, which may be a tool for responding to leafing of the pages;
- numeral 32 denotes an image in the display instead of a
15 doll;
- numeral 34 denotes a storage, for storing pictures, vocal signals, or mechanical movements of the doll;
- numeral 36 denotes a zone distinctive to a certain page, the zone including a detectable mark on the page; according to
20 the magnetic embodiment of sensing numeral 36, it is also a sensor for sensing a page, the sensor described as a resonance circuit;
- numeral 38 denotes a transmitter of the book;
- numeral 40 denotes a battery of the book;
- 25 - numeral 42 denotes a zone which is distinctive to another page, the zone including a detectable mark on that page; according to the magnetic embodiment of sensing numeral 42 is also a sensor for sensing that page, the sensor described as a resonance circuit;
- 30 - numeral 44a denotes a mark for marking a page; according

to the magnetic embodiment of sensing numeral 44a is a magnet;

- numeral 48 denotes a signal;
- numerals 48a and 48b denote sub-channels of a stereo
5 signal;
- numerals 50, 52, 54, and 56 denote electrical contacts on
the binding of the book;
- numerals 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78 and 80
denote electrical contacts of the pages of the book, which
10 are, according to the electrical contact embodiment, the
marks for detecting the pages;
- numeral 82 denotes a resonance circuit; and
- numeral 84 denotes a detecting system, for detecting the
current page.

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The foregoing description and illustrations of the embodiments of the invention has been presented for the purposes of illustration. It is not intended to be exhaustive or to limit the invention to the description above in any form.

What is claimed is:

CLAIMS

5 1. A responsive book system comprising:

- a book comprising a detecting system, for detecting a current page from a plurality of detectable pages of said book;
- a storage, for storing content associated with each of
- 10 said detectable pages; and
- one or more remote responders, for playing and/or displaying the content associated with said current page.

15 2. A responsive book system according to claim 1, wherein each of said remote responders is embedded in a member selected from a group including: a doll, a display, another object.

20 3. A responsive book system according to claim 1, wherein:

- said book further comprises a transmitter, for transmitting to said one or more remote responders a signal indicating said current page; and
- each of said one or more remote responders comprises a receiver, for receiving said signal.

25 4. A responsive book system according to claim 3, wherein said signal indicates said current page, thereby allowing each of said one or more responders to display said content associated with said current page.

5. A responsive book system according to claim 3, wherein said signal comprises said content.
- 5 6. A responsive book system according to claim 3, wherein said transmitter comprises a stereo-transmitter using a single standard stereo channel, such that each sub-channel thereof transmitting a different response to each of said remote responders.
- 10 7. A responsive book system according to claim 1, further comprising a recorder, for recording new content to be associated with said detectable pages.
- 15 8. A responsive book system according to claim 1, wherein said detecting system comprises:
- distinctive zones on the cross-sectional area of said book, each distinctive zone associated with one of said plurality of pages;
 - 20 - a detectable mark on each of said plurality of pages, each of said detectable marks located in said distinctive zone thereof, for providing said association; and
 - detectors for detecting said detectable marks.
- 25 9. A responsive book system according to claim 8, wherein said detectable mark is invisible.
10. A responsive book system according to claim 8, wherein said detectable mark comprises a first magnet.

11. A responsive book system according to claim 10, wherein each of said detectors comprises a resonance circuit in said distinctive zone in the binding of said book, for detecting said first magnet, for detecting said current page.
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12. A responsive book system according to claim 11, wherein said detecting system further comprises at least a second magnet located in said distinctive zone on at least one page between said first magnet and said resonance circuit, said
10 second magnet for increasing the detectability of said first magnet.
13. A responsive book system according to claim 8, wherein each of said detectable marks comprises an electrical
15 contact, for closing and opening an electrical circuit between said electrical contacts of adjacent pages, upon leafing of each of said current pages.
14. A method for using a responsive book, said method
20 comprising the steps of:
- detecting the current page in said book from a plurality of pages; and
 - playing and/or displaying, by a remote responder, content associated with said current page.
- 25
15. A method according to claim 14, further comprising the steps of:
- transmitting a signal from said book for indicating said current page; and
 - 30 - receiving said signal from said book, for providing said

response.

16. A method according to claim 15, wherein said transmitting is carried out by a stereo transmission, each stereo channel thereof transmitting content or indication of content associated with a different remote responder.
17. A method according to claim 14, further comprising the step of recording a new content to be associated with a page.
18. A method according to claim 18, wherein said detecting step comprises influencing a resonance circuit by a magnet located on a page.
19. A method according to claim 18, wherein said detecting step comprises closing or opening an electric circuit upon leafing using electric contacts on said pages.
20. A method according to claim 13, wherein said responding comprises a member selected from a group including: recording, reading, moving.