INTEGRATED MAGNETIC DEVICE AND A MAGNETIC BOARD THEREOF

Inventor: Pi-Fen Lin, Keelung City (TW)

Correspondence Address:
NIKOLAI & MERSEREAU, P.A.
900 SECOND AVENUE SOUTH, SUITE 820
MINNEAPOLIS, MN 55402 (US)

Filed: Jun. 4, 2009

ABSTRACT

An integrated magnetic device and a magnetic board thereof are disclosed, which attract portable electronic devices located on the board. The magnetic board includes a body, a magnetic element and a power transmission unit on the body, and a power unit. The magnetic elements of the magnetic board and the portable electronic device attract each other so that the electronic device may be located on the board. The power transmission units of the magnetic board may connect with the portable electronic device, for charging the electronic device’s battery. The magnetic board further comprises a signal transmission unit for transmitting the portable electronic device’s signals to an output device. The integrated magnetic device further comprises a magnetic holder for carrying the portable electronic device and being magnetically attached to the board. Multiple magnetic boards may connect with each other to enlarge the area for magnetically attaching more portable electronic devices.
magnetic board

power unit

second signal transmission unit

control unit

output device

FIG. 4
FIG. 7
INTEGRATED MAGNETIC DEVICE AND A MAGNETIC BOARD THEREOF

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention
[0002] The present invention relates to an integrated magnetic device and a magnetic board thereof, in particular, to a magnetic device and its magnetic board for magnetically attracting and attaching articles.
[0003] 2. Description of Related Art
[0004] People nowadays are tied closely to various portable electronic devices, examples of which are cell phones and PDAs for personal usage, media players and handheld game consoles for entertainment, electronic photo frames and alarm clocks commonly located indoor, and all kinds of controllers everywhere. Not only do these portable electronic devices provide great convenience to users, but some of which become essential necessities for users. For example, one may own a PDA and two or more cell phones while also possess a music player and a game console for leisure time. As there are a lot of the electronic items that needs to be keep track of it will cause great inconvenience if items are lost due to the lack of proper organization.
[0005] Generally speaking, ways of putting things in order depend mostly on the user voluntarily checking items or locating items from specific places. For instance, cell phones are gathered on the desk, music players may be located within backpacks, and controllers gathering in a same drawer and the like. However, this solution is unsystematic. The collected devices might be hidden from view by other objects or even damaged as a result of recklessness.

SUMMARY OF THE INVENTION

[0006] The object of the present invention is to provide an integrated magnetic device and a magnetic board thereof.
[0007] In accordance with one aspect of the present invention, the above and other objects can be accomplished by the provision of a magnetic board for attracting a portable electronic device with a first magnetic element and a first power transmission unit. The board includes: a body, a second magnetic element, a second power transmission unit, and a power unit. The second magnetic element and the second power transmission unit are installed on the body, and the power unit transmits electricity to the second power transmission unit. The second magnetic element may attract and magnetically attach with the first magnetic element, so as to place the portable electronic device on the magnetic board. The second power transmission unit connects with the first power transmission unit, through which the portable electronic device receives electricity from the power unit.
[0008] In accordance with another aspect of the present invention, another magnetic board herein is provided for attracting a portable electronic device with a first magnetic element and a first signal transmission unit. The board includes: a body, a second magnetic element, a second signal transmission unit, an output device, and a power unit. The second magnetic element and the second signal transmission unit are installed on the body. The output device may be built-in or added-on to the board. The power unit is for transmitting electricity to the second signal transmission unit and the output device. The second magnetic element may attract and magnetically attach to the first magnetic element, so as to place the portable electronic device on the magnetic board.

The first signal transmission unit, connecting with the second signal transmission unit, is for transmitting signals of the portable electronic device to the second signal transmission unit, from which the output device outputs the received signals.
[0009] In accordance with yet another aspect of the present invention, an integrated magnetic device including a magnetic board and a magnetic board is provided. The magnetic holder has a first magnetic element and a container, wherein a portable electronic device may be placed in the container. The magnetic board includes a body and a second magnetic element. The first magnetic element may attract and magnetically attach to the second magnetic element, so that the portable electronic device may be placed on the magnetic board through the magnetic holder.
[0010] In accordance with still another aspect of the present invention, another integrated magnetic device having a plurality of magnetic boards is disclosed herein. The magnetic boards are connected with one another, in order to enlarge the attracting area of the device and share electricity.

[0011] In order to further the understanding regarding the present invention, the following embodiments are provided along with illustrations to facilitate the disclosure of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 shows a perspective view of a magnetic board in accordance with one embodiment of the present invention;
[0013] FIG. 2 shows a perspective view of a magnetic board capable of transmitting electricity, in accordance with one embodiment of the present invention;
[0014] FIG. 3 shows a perspective view of a magnetic board capable of transmitting signals, in accordance with one embodiment of the present invention;
[0015] FIG. 4 shows a block diagram of a magnetic board in accordance with one embodiment of the present invention;
[0016] FIG. 5 shows a perspective view of a magnetic board capable of transmitting electricity and signals, in accordance with one embodiment of the present invention;
[0017] FIG. 6 shows a perspective view of an integrated magnetic device in accordance with one embodiment of the present invention;
[0018] FIG. 7 shows a lateral view of a magnetic board in accordance with one embodiment of the present invention;
[0019] FIG. 8 shows a perspective view of an integrated magnetic device with electricity transmission, in accordance with one embodiment of the present invention; and
[0020] FIG. 9 shows a perspective view of an integrated magnetic device with signals transmission, in accordance with one embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] The present invention discloses an integrated magnetic device and a magnetic board thereof, which magnetically attract portable electronic devices with magnetic elements, so as to collect devices and keep devices in order. For further understanding of the present invention, detailed descriptions will be illustrated in the subsequent disclosure and appended drawings.
[0022] Please refer to FIG. 1, which shows a perspective view of a magnetic board of one embodiment of the present invention, wherein the magnetic board can attract a portable
electronic device 1 with a first magnetic element 10. The magnetic board 1 includes a body 20, a second magnetic element 22 disposed at the body 20, and the first magnetic element 10 magnetically attracts the second magnetic element 22 for placing the portable electronic device 1 on the magnetic board 2. By way of attracting and positioning electronic devices on the magnetic board 2, a variety of portable electronic devices that originally placed in disorder, such as controllers, cell phones, PDAs, electronic photo frames, or media players, can easily be gathered up.

The second magnetic element 22 is composed of a plurality of magnetic members which are arranged in a star-like shape. One preferred embodiment of the second magnetic element 22 is composed of eight magnetic members and arranged within the body 20, in order to use the least magnetic material to get the widest magnetic attraction area. For attracting with each other, one of the first magnetic element 10 and the second magnetic element 22 may be a magnet, and the other may be a metal attractable to the magnet, such as iron. Furthermore the first magnetic element 10 and the second magnetic element 22 may both be magnets for attracting each other, resulting in placing the portable electronic device 1 on the magnetic board 2.

Refer to FIG. 2, which shows another embodiment of the magnetic board based on the board shown in FIG. 1. The magnetic board 2a shown in FIG. 2 not only is capable of attracting a portable electronic device 1b with a first magnetic element 10 for collecting the portable electronic device 1b, but also has the ability to change an electronic device with a first power transmission unit 12, such as a cell phone 1a or an electronic photo frame 1c.

In addition to the second magnetic element 22 on the body 20, a second power transmission unit 24 and a power unit 26 are further installed at the magnetic board 2a. The power unit 26 transmits electricity to the second power transmission unit 24, wherein the electricity comes from the utility power or a battery. For example, the power unit 26 of this embodiment is a power line and a plug, retrieving the utility power by plugging into a power socket for transmitting electricity to the second power transmission unit 24. After being attracted on the magnetic board 2a, the portable electronic device 1a or 1c connects the second power transmission unit 24 with the first power transmission unit 12 via a power cable 36, so as to continuously charge the device 1a or 1c with the electricity of the utility power or the battery transmitted by the power unit 26.

Taking the cell phone 1a for instance, its first power transmission unit 12 is a power jack; the second power transmission unit 24 is a single or a plurality of power socket(s); the two units connect to each other by the power cable 36 of the cell phone 1a and a transformer, thereby achieving the goal of charging the cell phone 1a. Given the electronic photo frame 1c as another example, after placing the frame 1c on the magnetic board 2a via the attraction between the first magnetic element 10 and the second magnetic element 22, the power cable 36 is used to connect the frame 1c with the power socket of the board 2a, then the frame 1c retrieves the electricity needed for displaying electronic photos. Hence, a user is able to enjoy the photos displayed by the frame 1c: simply on the magnetic board 2a. Therefore, the portable electronic device 1a or 1c that needs electricity for operation or charging is able to get the necessary electricity while being placed on the board 2a, instead of having to separate from the board 2a in order to locate a power socket.

The aforementioned second power transmission unit 24 may be installed within the body 20; furthermore, the power socket, for being connected with the plug of the portable electronic device 1a or 1c, can be mounted on the surface of body 20.

Refer to FIGS. 3 and 4, providing another magnetic board to illustrate an integration of signals transmission and output via a first signal transmission unit 14 of the portable electronic device, so as to output the data or signals of the portable electronic device.

The magnetic board 2b of the present embodiment includes the power unit 26a, a second signal transmission unit 28 arranged at the body 20, and an output device 30 that is built-in or added-on to the magnetic board 2b. The power unit 26a is a battery, thus the magnetic board 2b receives the necessary electricity without having to resort to the utility power. Additionally, referring to FIG. 4, a control unit 32 is configured within the body 20 of the board 2b, which controls the power transmission of the power unit 26a and the signal transmission between the second signal transmission unit 28 and the output device 30.

The first signal transmission unit 14 of the portable electronic device 1a or 1d can be one or the combination of a USB port, an eSATA port, or an audio port; the second signal transmission unit 28 may be a corresponding connection port of the first signal transmission unit 14. The output device 30 may be a display screen or a sound player. The output device 30 in FIG. 3 is externally added-on to the magnetic board 2b, but the illustration is not meant to limit the arrangement of the output device 30. Those skilled in the art may place other types of built-in output device in a proper place of the board 2b in accordance to other embodiment variations of the present invention.

Taking the cell phone 1a again for example, while the cell phone 1a is placed on the magnetic board 2b; a signal cable 38 is used for connecting the first signal transmission unit 14 and second signal transmission unit 28 (e.g. connecting to corresponding USB ports), and the photos or videos stored in the cell phone 1a is transmitted as a series of signals to the second signal transmission unit 28. The control unit 32 transmits the signals received by the second signal transmission unit 28 to the output device 30, such as a display screen, for displaying the photos or videos stored in the cell phone 1a. As for the music player 1d (e.g. MP3 player), the first signal transmission unit 14 may be an audio port (e.g. audio jack) connecting with the second signal transmission unit 28 that is also an audio port (e.g. audio plug) via an audio signal cable 38. The control unit 32 broadcasts the music stored in the music player 1d through a speaker via the link made between the speaker and the music player 1d.

Refer to FIG. 4 now, the control unit 32 may, control the power unit 26 to transmit electricity to the second signal transmission unit 28 and the output device 30, in order to provide the necessary electricity for operation. Meanwhile, the control unit 32 further controls the second signal transmission unit 28 to identify the portable electronic device that connects to the signal transmission unit 28, and transmit the signals to a proper output device 30 according to the signal type of the electronic device. Therefore, the control unit 32 may include power management elements, USB driver, audio driver or graphic driver, and the like.

The magnetic board 2b of the aforementioned embodiment not only provides the convenience of collecting portable electronic devices, but also integrates different trans-
mission interfaces and output devices so that the magnetic board 2b may act as a media or data output center of electronic devices. Signals or data of the electronic devices placed on the magnetic board 2b can be transmitted and outputted right on the board 2b.

[0034] FIG. 5 illustrates another embodiment of the magnetic board of the present invention, which installs both the second power transmission unit 24 and the second signal transmission unit 28 at the magnetic board 2c; furthermore the built-in output device 30a is installed at the body 20, such as the LEDs and the speaker shown in FIG. 5. The power unit 26 transmits electricity to both the second power transmission unit 24 and the second signal transmission unit 28 (controlled by the control unit 32). Hence, the portable electronic device call connect to the second power transmission unit 24 for battery charging (e.g. device 1a as shown), or it can connect to the second signal transmission unit 28 for transmitting signals (e.g. device 1e as shown).

[0035] In the present embodiment, the portable electronic device 1e that may transmit signals is a sensor, like a photosensor, a temperature sensor, a sound sensor, or a humidity sensor, etc. used for detecting environmental chances. The sensor is connected to the second power transmission unit 24 so as to receive the electricity needed for operation, and connected to the second signal transmission unit 28 to link the output device 30a via the control unit 32. When the sensor detects the environmental changes, the output device 30a sends out an alert according to the detection from the sensor. For instance, an alert signal is sent out from the temperature sensor when a rise in temperature is determined, and the control unit makes the LEDs flash or the speaker broadcast voice alert based on the alert signal. The present magnetic board 2c can further integrate security function through appropriate modification, like broadcasting voice warnings when a sound sensor detects unusual sound.

[0036] Considering that some of the portable electronic devices do not have magnetic elements for the magnetic board, FIG. 6 illustrates an integrated magnetic device of the present invention.

[0037] The integrated magnetic device of this embodiment includes a magnetic board 2d and a magnetic holder 4. The structure of the magnetic board 2d may be any one of the aforementioned magnetic boards, please refer to FIGS. 1 to 5 and the related statements. A container 42 is mount on one side of the magnetic holder 4 (e.g. the front side), which is used to contain the portable electronic device 1d. The other side (e.g., the back side) of the magnetic holder 4 is configured with the first magnetic element 40, which is used to connect with the second magnetic element 22, so as to place the magnetic holder 4 and the portable electronic device 1d held by the container 42 on the magnetic board 2d. This approach solves the problem that electronic devices without magnetic elements can not be magnetically attached to the magnetic board. The first magnetic element 40 is a magnet or metal which is capable of attracting with the second magnetic element 22.

[0038] Now reference is made to FIG. 7, in the present invention, the aforementioned magnetic board further includes a fixing part 34, which is used for fastening the magnetic board on an object 5 like a wall. For instance, adhere a backside of the magnetic board to the surface of the object 5 by using twin adhesive tapes, or hang the magnetic board on the wall by a hook.

[0039] Though all the second power transmission unit 24 and the second signal transmission unit 28 shown in the aforementioned figures are placed on the same surface of the board where the portable electronic devices are located, however, transmission units mentioned here can also be set at a side of the board as shown by the second power transmission unit 24a and the second signal transmission unit 28a in FIG. 7. Gathering the transmission units at a side of the board not only keeps the surface of the board neat but also increases the area left for attracting and magnetically attaching electronic devices.

[0040] In order to enlarge the area for attracting and magnetically attaching electronic devices, multiple magnetic boards with power or signal transmission unit can be connected with each other via a connection unit assembled on the boards, and share electricity or signals with each other.

[0041] Refer to FIG. 8, which illustrates another embodiment of an integrated magnetic device. Each of the magnetic board 2x, 2y, and 2z are configured with a power transmission unit 24x on the body, wherein the power transmission unit 24x includes a plurality of power jacks. The power unit 26 of the magnetic board 2x is used for transmitting utility power or battery power, two magnetic boards 2y plug in the power jacks of the magnetic board 2x separately via a power cable 36, so as to receive electricity transmitted from the board 2x. The magnetic board 2z further plugs into the power jack of one of the boards 2y via a plug, thereby receiving electricity from the board 2x through the plugged magnetic board 2y. The area of the integrated magnetic device of the present embodiment can be expanded as described above, as long as the electricity load has not been exceeded.

[0042] Connections between magnetic boards of the above embodiment can also be implemented through signal connection. As shown in FIG. 9, each of the magnetic board 2x, 2y, and 2z configure with a signal transmission unit 28x on the body for transmitting signals. Through the connection between the signal transmission unit 28x and a signal cable 36, the data of a portable electronic device 1a attracted and magnetically attached to the magnetic board 2x can be transmitted and outputted to an output device 30 connected with the magnetic board 2x, such as transmitting and outputting pictures stored in a cell phone for display.

[0043] According to the aforementioned descriptions made to the embodiments, the present invention accomplishes at least the following goals:

[0044] First, the magnetic board may be used for collecting a variety of portable electronic devices easily preventing portable devices from being lost;

[0045] Second, the magnetic board configured with the power unit and the power transmission unit can provide the necessary electricity to the electronic device attracted and attached magnetically on the board;

[0046] Third, the magnetic board configured with the signal transmission unit and the control unit may be used for transmitting data or signals within the electronic device to the built-in or add-on output device, or output alert messages according to the signal from the electronic sensor;

[0047] Fourth, using the integrated magnetic device with the magnetic holder and the magnetic board, portable electronic devices, especially those without magnetic element installed, may be easily placed on the board; and

[0048] Fifth, connecting multiple magnetic boards together enlarges and expands the area of the magnetic device and thereby is able to attract and magnetically attach more elec-
tronic devices; electricity and signals can be transmitted in sequence through connecting the power or the signal transmission unit.

[0049] The descriptions illustrated supra set forth simply the preferred embodiments of the present invention; however, the characteristics of the present invention are by no means restricted thereto. All changes, alternations, or modifications conveniently considered by those skilled in the art are deemed to be encompassed within the scope of the present invention delineated by the following claims.

What is claimed is:
1. A magnetic board for attracting and magnetically attaching a portable electronic device configured with a first magnetic element and a first signal transmission unit, the board comprising:
   a body;
   a second magnetic element, disposed at the body, for attracting and magnetically attaching the first magnetic element;
   a second signal transmission unit, assembled on the body, for connecting with the first signal transmission unit;
   an output device, built-in or added-on to the magnetic board, for outputting a signal received by the second signal transmission unit;
   a power unit, for transmitting electricity to the second signal transmission unit and the output device; wherein the portable electronic device transmits the signal from the first signal transmission unit to the second signal transmission unit.
2. The magnetic board according to claim 1, further comprising:
   a control unit, connected with the second signal transmission unit, the output device, and the power unit, for controlling the second signal transmission unit to transmit the signal to the output device and controlling the power unit to transmit electricity.
3. The magnetic board according to claim 2, wherein the output device is an image display device or a sound device.
4. The magnetic board according to claim 3, wherein the portable electronic device is a sensor for detecting environmental changes, the output device is for sending out an alert according to the environmental change detected by the sensor.
5. The magnetic board according to claim 4, wherein the sensor is a photosensor, a temperature sensor, a sound sensor, or a humidity sensor.
6. The magnetic board according to claim 1, wherein the portable electronic device further comprises a first power transmission unit, the magnetic board further comprising a second power transmission unit configured on the body, the first power transmission unit connects with the second power transmission unit and the power unit is for transmitting electricity to the second power transmission unit.
7. The magnetic board according to claim 1, wherein the first magnetic element is a magnet or a metal, and the second magnetic element is a magnet or a metal attachable and magnetically attachable to the first magnetic element.
8. The magnetic board according to claim 1, wherein the second magnetic element is composed of a plurality of magnetic members, arranged on the body in a star-like shape with eight ends.
9. The magnetic board according to claim 1, further comprising:
   a fixing part, installed on the body for fixing the magnetic board.
10. A magnetic board for attracting and magnetically attaching a portable electronic device is configured with a first magnetic element and a first power transmission unit, the board comprising:
    a body;
    a second magnetic element, disposed within the body, for attracting and magnetically attaching the first magnetic element;
    a second power transmission unit, assembled on the body, for connecting with the first power transmission unit;
    a power unit, for transmitting electricity to the second power transmission unit, wherein the portable electronic device transmits power from the first power transmission unit to the second power transmission unit.
11. The magnetic board according to claim 10, wherein the first magnetic element is a magnet or a metal, and the second magnetic element is a magnet or a metal attachable and magnetically attachable to the first magnetic element.
12. The magnetic board according to claim 10, wherein the second magnetic element is composed of a plurality of magnetic members arranged on the body in a star-like shape with eight ends.
13. The magnetic board according to claim 10, further comprising:
    a fixing part, installed on the body for fixing the magnetic board.
14. An integrated magnetic device for attracting and magnetically attaching a portable electronic device, comprising:
    a magnetic holder, having a first magnetic element and a container, for containing the portable electronic device;
    a magnetic board, comprising:
    a body; and
    a second magnetic element, installed within the body, for attracting and magnetically attaching the first magnetic element.
15. The magnetic device according to claim 14, wherein the first magnetic element is a magnet or a metal, and the second magnetic element is a magnet or a metal attachable and magnetically attachable to the first magnetic element.
16. An integrated magnetic device, comprising:
   a first magnetic board, comprising:
   a first body; and
   a first transmitting unit installed in the first body;
   a second magnetic board, comprising:
   a second body;
   a first connection unit, configured in the second body and connected with the first transmitting unit; and
   a second transmitting unit installed in the second body and electronically connected with the first connection unit.
17. The integrated magnetic device according to claim 16, wherein the first magnetic board further comprises a power unit, for transmitting electricity to the first transmitting unit.
18. The integrated magnetic device according to claim 17, wherein the first transmitting unit and the second transmitting unit are both power transmission units.
19. The integrated magnetic device according to claim 18, wherein the first connection unit is a power cable, for transmitting power to the second transmitting unit.

20. The integrated magnetic device according to claim 16, wherein the first transmitting unit and the second transmitting unit are both signal transmission units, the first connection unit is a signal transmitting cable.

21. The integrated magnetic device according to claim 16, further comprises;