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FLEXIBLE MERCHANDISE SECURITY DEVICE

FIELD OF THE INVENTION

[0001] Embodiments of the present invention relate generally to merchandise display security devices and methods for protecting an item of merchandise from theft.

BACKGROUND OF THE INVENTION

[0002] It is common practice for retailers to store and/or display relatively expensive items of merchandise on or within a merchandise security device, such as a security display (e.g. alarming stand), security fixture (e.g. locking hook, shelf, cabinet, etc.) or security packaging (e.g. merchandise safer). Regardless, the merchandise security device displays and/or stores an item of merchandise so that a potential purchaser may view, and in some instances, interact with the merchandise before making a decision whether to purchase the item. At the same time, the item is secured on or within the merchandise security device so as to prevent, or at least deter, theft of the item. The value of the item, however, may make it an attractive target for a shoplifter despite the presence of a merchandise security device. A determined shoplifter may attempt to detach the item from the security display, or attempt to remove the item from the security fixture or from the security packaging. Alternatively, the shoplifter may attempt to remove the security device, or at least a portion thereof, from the display area along with the item.

[0003] In the case of a security display or security fixture, the security device is oftentimes firmly attached to a support, such as a pegboard, wire grid, horizontal bar rack, slatwall (also known as slatboard), wall, table, desk, countertop or like structure. In some instances, the security device is secured to the support using a mechanical lock mechanism, for example a conventional tumbler lock or a magnetic lock, operated by a non-programmable key. In other instances, the security device is secured to the support using an electronic lock mechanism operated by a programmable electronic key.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0004] Referring now to the accompanying drawing figures wherein like reference numerals denote like elements throughout the various views, one or more embodiments of a merchandise display security device and method are shown. Merchandise security devices according to embodiments of the invention include, but are not limited to, a security display (e.g. alarming stand or module), security fixture (e.g. locking hook, shelf, cabinet, etc.), security wraps or cables, garment tags, or security packaging (e.g. merchandise safer) for securing an item of merchandise from theft. In one particular embodiment described below, the security device is a merchandise safer configured to house one or more items of merchandise.

[0005] FIGS. 1-2 illustrate a merchandise security device 10 according to an embodiment of the invention. In this embodiment, the security device 10 is a lockable enclosure commonly referred to in the art as a “safer.” The security device 10 includes a housing 20 defining a generally hollow interior compartment configured to receive at least one item of merchandise M therein. In some embodiments, the housing 20 is flexible and is not rigid. The housing 20 may be a flexible bag or collapsible bag in some cases. Thus, the housing 20 may be configured to conform to different shapes and thereby accommodate items of merchandise having various shapes. In addition, the housing 20 may be configured to be folded on itself or to be collapsed thereby allowing the housing to be stored in a folded configuration and allowing multiple housings to be stacked upon one another.

[0006] The housing 20 may take many configurations. For example, FIG. 1 shows that the housing may define a closure member 22 that is configured to close an opening defined in the housing. The opening is sized and configured to receive an item of merchandise therein. The closure member 22 could be any desired member configured to seal or otherwise render items of merchandise contained within the housing inaccessible. For instance, the closure member 22 could be a zipper, a series of buttons or snaps, a latch, ziplock, or the like. In other instances, the housing 20 may be operably engaged with a lid that is configured to move between opened and closed positions for allowing access to the opening or rendering the opening inaccessible.

[0007] The aforementioned housing may be formed of any desired material such as a clear polymeric material so that an item of merchandise can be seen through the housing. The housing

may be generally formed of a thin flexible material. The housing may be any desired shape, such as a housing with a bottom surface and four sidewalls extending from the bottom surface to an open end. In other cases, the housing may be a bag with two sidewalls.

[0008] The security device 10 may also include a lock mechanism 30 operably engaged with the housing 20. The lock mechanism 30 may be configured to lock the closure member 22 in position such that the closure member is unable to move or otherwise allow the opening defined in the housing to be accessed. For example, the lock mechanism 30 may cooperate with a shape memory material such that a change in shape of the shape memory material may cause mechanical actuation (e.g., linear and/or rotary movement) of the lock mechanism. In addition, other mechanisms may be utilized for actuating a lock mechanism, including mechanical, magnetic, electrical, and/or chemical state changes. As such, the security devices and associated lock mechanisms should not be limited in light of the embodiments shown and described herein.

[0009] In some embodiments, the housing 20 comprises a flexible circuit 32 and monitoring electronics or circuit 34. The flexible circuit 32 is configured to be electrically connected to the monitoring electronics 34. All or a portion of the flexible circuit 32 may be flexible. In some embodiments, the flexible circuit is ribbon like and bendable so as to be conformable to various surface contours. Thus, the housing 20 and flexible circuit 32 may both be flexible, and neither the housing or the flexible circuit may substantially inhibit the flexibility of the other.

[0010] The flexible circuit 32 may include one or more conductors or traces extending at least partially along the length of the housing 20 for completing a sense loop with the monitoring electronics 34. The conductors may extend along the housing in any desired pattern. Thus, should the flexible circuit 32 be cut, torn, disconnected, or removed, the monitoring electronics 34 may be configured to detect an interruption in the sense loop and to generate a security signal (e.g., an audible and/or a visible signal). Thus, should a potential thief cut the housing 20 and interrupt the sense loop, the monitoring electronics 34 may in turn generate a security signal. The monitoring electronics 34 may be in communication with a power source for facilitating monitoring of the flexible circuit and generation of a security signal.

[0011] The flexible circuit 32 may be integrated with the housing 20 in some embodiments. For example, the flexible circuit 32 may be sandwiched between layers of the housing or molded

within the sidewall of the housing 20. Alternatively, the flexible circuit 32 may be attached to the housing 20. For instance, the flexible circuit 32 may include an adhesive or other attachment means for being secured to the housing 20, such as a releasable pressure-sensitive adhesive. The flexible circuit 32 may be located at any desired location on the housing 20, such as substantially along a front surface 36 and rear surface 38 of the housing. In addition, one or more flexible circuits 32 may be employed. In this regard, a single flexible circuit 32 could be used whereby the conductors extend along each surface of the housing, or separate flexible circuits could be used on different surfaces of the housing.

[0012] In some cases, the flexible circuit 32 may be configured to tear when the flexible circuit is removed from the housing 20 or the housing is forcibly opened. For instance, the flexible circuit 32 may include one or more tear locations that are configured to tear and thereby interrupt the sense loop when removed. Thus, the flexible circuit 32 and/or housing 20 may be disposable in some embodiments. According to some embodiments, the flexible circuit may be similar to that disclosed in International Application No. PCT/US2014/62769, entitled Flexible Sensor for a Portable Electronic Device, the entire contents of which are incorporated herein by reference.

[0013] In some embodiments, the housing 20 may define one or more openings 40 configured to receive a rod therethrough for hanging one or more of the security devices 10 on the rod in a display orientation. In other cases, a hang tag may be attached to the housing 20 for hanging the security device on a rod.

[0014] The monitoring electronics 34 may be armed using various techniques. For example, the monitoring electronics 34 may be automatically armed upon closing the closure member 22 or locking the lock mechanism 30. In one embodiment, the monitoring electronics 34 may only be configured to be armed, such as when the lock mechanism 30 is locked. Thus, the monitoring electronics 34 may not be configured to be disarmed once armed, which allows the monitoring circuit to monitor the state of the flexible circuit 32. In other cases, the monitoring electronics 34 is configured to be armed in response to communication with an authorized key.

[0015] The lock mechanism 30 and/or monitoring electronics 34 may be configured to communicate with a key for locking or unlocking the lock mechanism or arming or disarming the monitoring electronics 34. For example, a key may be used to unlock the lock mechanism 30 to

allow the closure member 22 to be opened for accessing the item of merchandise. In some instances, the key and lock mechanism may exchange data (e.g., a security code) to determine whether the key is authorized to unlock the lock mechanism. Where the security codes match, the key may unlock the lock mechanism. In one embodiment, the lock mechanism 30 is configured to receive electrical power from an electronic key for unlocking the lock mechanism. In other cases, the lock mechanism may be operated using a mechanical or magnetic key.

[0016] In some embodiments, the electronic key may be useable with any security device that utilizes power transferred from the key to operate a mechanical lock mechanism associated with the security device, and/or utilizes data transferred from the key to authorize the operation of a mechanical lock mechanism or monitoring electronics. In other words, an electronic key according to embodiments of the invention is useable with any security device or lock mechanism that requires power transferred from the key to the device and/or data transferred between the key and the device. Power may be transferred using any desired technique, such as via electrical contacts or inductively. Likewise, data may be transferred using various techniques such as via infrared communication or other wireless communications protocols.

[0017] In certain embodiments, the merchandise security device is a passive device. As used herein, the term “passive” is intended to mean that the security device does not have an internal power source (e.g., a battery) sufficient to lock and/or unlock a mechanical lock mechanism. As such, the security device may employ a simplified lock mechanism that does not require various components operated by its own source of electrical power. However, in other embodiments, the security device may include a power source, such as for powering the monitoring electronics.

[0018] In some embodiments, the electronic key is similar to that disclosed in U.S. Patent Publication No. 2012/0047972, entitled Electronic Key for Merchandise Security Device and filed August 31, 2011, and U.S. Patent Publication No. 2011/0254661, entitled Programmable Security System and Method for Protecting Merchandise and filed June 27, 2011, each of the disclosures of which is incorporated herein by reference in its entirety.

[0019] The foregoing has described one or more exemplary embodiments of a merchandise display security system and method for use with an electronic key. Embodiments of a merchandise display security system have been shown and described herein for purposes of illustrating and

enabling one of ordinary skill in the art to make, use and practice the invention. Those of ordinary skill in the art, however, will readily understand and appreciate that numerous variations and modifications of the invention may be made without departing from the spirit and scope thereof. Accordingly, all such variations and modifications are intended to be encompassed by the appended claims.

That which is claimed is:

1. A merchandise security device for protecting items of merchandise from theft, the merchandise security device comprising:

a housing configured to receive at least one item of merchandise therein, the housing comprising a flexible circuit for defining a sense loop;

a closure member configured to close an opening defined in the housing;

a lock mechanism configured to secure the closure member; and

monitoring electronics in communication with the flexible circuit and configured to detect an interruption in the sense loop.

2. The merchandise security device of Claim 1, wherein the housing is flexible.

3. The merchandise security device of Claim 1, wherein the housing is a flexible bag.

4. The merchandise security device of Claim 1, wherein the monitoring electronics is configured to generate a security signal in response to interruption of the sense loop.

5. The merchandise security device of Claim 1, wherein the flexible circuit is integrated with the housing.

6. The merchandise security device of Claim 1, wherein the flexible circuit is attached to the housing.

7. The merchandise security device of Claim 1, wherein the closure member is configured to be moved relative to the housing for opening and closing the opening defined in the housing.

ABSTRACT

A merchandise security device is provided. The merchandise security device may include a housing configured to receive at least one item of merchandise therein. The housing includes a flexible circuit for defining a sense loop. The security device also includes a closure member configured to close an opening defined in the housing and a lock mechanism configured to secure the closure member. The security device further includes monitoring electronics in communication with the flexible circuit and configured to detect an interruption in the sense loop.

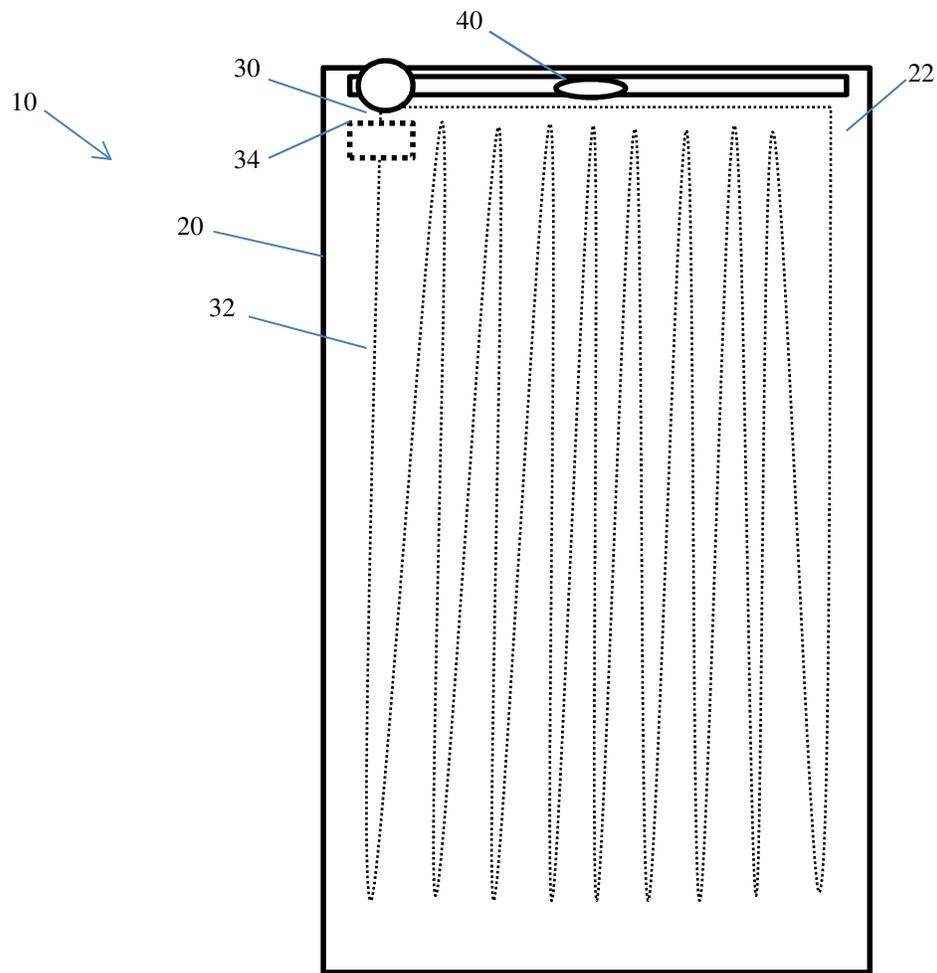


FIGURE 1

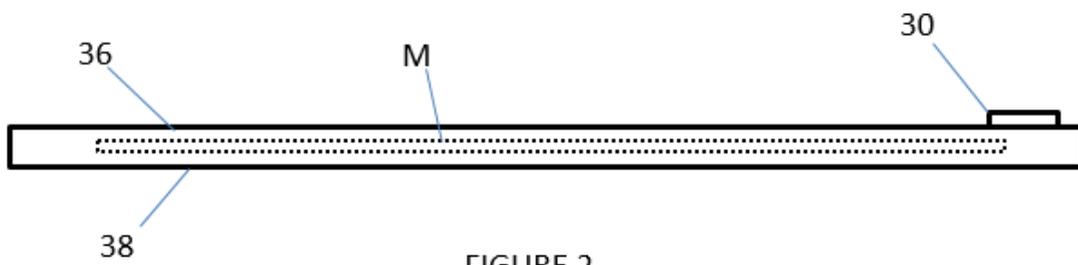


FIGURE 2