MERCHANDISE DISPLAY SECURITY SYSTEMS WITH FLEXIBLE CONNECTOR

InVue Security Products Inc.

Follow this and additional works at: http://www.tdcommons.org/invue

Recommended Citation
InVue Security Products Inc., "MERCHANDISE DISPLAY SECURITY SYSTEMS WITH FLEXIBLE CONNECTOR", Technical Disclosure Commons, (September 09, 2016)
http://www.tdcommons.org/invue/10
MERCHANDISE DISPLAY SECURITY SYSTEMS
WITH FLEXIBLE CONNECTOR

FIELD OF THE INVENTION

[0001] Embodiments of the present invention relate generally to merchandise display security systems and methods for displaying and protecting items of merchandise against theft.

BACKGROUND OF THE INVENTION

[0002] It is common practice for retailers to display electronic items of merchandise on a merchandise display security device. The security device displays an item of merchandise so that a potential purchaser can readily view and, in some instances, operate the item when making a decision whether to purchase the item. At the same time, the item of merchandise is usually physically secured on the security device so as to prevent, or at least deter, theft of the item. The merchandise display security device may also include an audible and/or visible alarm that is activated to alert store personnel in the event that a shoplifter attempts to separate the item of merchandise from the security device.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0003] 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 system are shown. FIG. 1 shows various components of a merchandise display security system 10 including a sensor 14 and an alarm module 20. According to various embodiments, the merchandise display security system 10 is configured for use with various types of items of merchandise. The item of merchandise M may be a display model or an operational sample of electronic merchandise, such as portable computers (e.g. notebooks, laptops, tablets, etc.), e-readers, mobile phones, smart phones, media players, and the like, for a customer to examine before making a
decision to purchase the item. The item of merchandise M may be typically displayed in a manner that permits a prospective purchaser to evaluate the operation and features of the merchandise, while protecting the merchandise from a potential thief. As explained in further detail below, a sensor may be operably engaged with the article of merchandise M at one end, and according to one embodiment, a security event (e.g., removal, cutting, or tampering of the sensor) may result in the generation of a security signal (e.g., an audible and/or visual alarm).

[0004] FIG. 1 shows a merchandise display security system 10 including an embodiment of a sensor 14 and an alarm module 20 connected by a cable 16. The sensor 14 may be electrically connected to the alarm module 20. The alarm module 20 may be configured to be secured to a support surface (e.g., a counter, shelf, or the like), such as with a releasable adhesive. The alarm module 20 may contain monitoring electronics that monitor the state of the sensor 14 for detecting whether the item of merchandise is securely attached to the sensor. The alarm module 20 may also contain an audible alarm and/or a visible alarm, such as a piezoelectric transducer and/or LED, that is activated when the monitoring electronics detects that the sensor indicates an “unsecured” or “alarm” state. Moreover, the alarm module 20 may contain an internal power source (e.g., a battery) for providing power to the monitoring electronics and the sensor, or alternatively or additionally, may comprise a main power cord that is electrically connected to an external power source, such as a direct current (DC) transformer and an alternating current (AC) electrical outlet.

[0005] Thus, when the sensor 14 is attached to an item of merchandise, a sense loop may be configured to be defined between the alarm module 20, the cable 16 (via one or more conductors), and the sensor. Thus, the alarm module 20 may be configured to monitor the integrity of the sensor 14. For example, the alarm module 20 may be configured to detect cutting of the cable 16, disconnecting the sensor 14 from the item of merchandise, and/or removing the alarm module from a support surface. The alarm module may in turn be configured to generate an audible and/or a visible alarm in response to interruption of the sense loop.
In some embodiments, the alarm module 20 is configured to be armed and/or disarmed. For example, the alarm module 20 may be configured to communicate with a key for arming and disarming thereof via a communications port 23 on the alarm module 20 (see, e.g., FIG. 2). In one embodiment, the key is an electronic key and may be configured to communicate wirelessly with the alarm module 20. In some cases, the key and the alarm module may each store a unique security code, and the key is configured to arm and/or disarm the alarm module upon a matching of the security codes. In other embodiments, the key is similar to that disclosed in U.S. Patent No. 7,737,845 entitled Programmable Key for a Security System for Protecting Merchandise, the contents of which are incorporated by reference herein in its entirety.

In another embodiment shown in FIG. 3, the alarm module 20 may not be configured to communicate with a key. In this instance, the alarm module 20 cannot be disarmed once it is armed and the sense loop closed, which may occur when the alarm module is secured to a support surface and the sensor 14 is secured to an item of merchandise. In this embodiment, the alarm module 20 may include a test actuator 25 to ensure that the alarm module is armed and has power. The test actuator 25 may have an internal switch that is actuated when the test actuator is actuated, and the alarm module may be configured to generate an audible and/or visual signal to indicate that the alarm module is armed.

As shown in FIG. 1, a cable 16 may extend between the alarm module 20 and the sensor 14 to electrically interconnect monitoring electronics disposed within the alarm module with the sensor. The monitoring electronics may be configured to detect when the cable 16 is cut or removed from the sensor 14 or alarm module 20 in an unauthorized manner and to generate an audible and/or a visible alarm in response thereto. Thus, the cable 16 may include one or more conductors for defining a sense loop, wherein interruption of the sense loop results in the generation of an alarm. In some embodiments, the cable may be elastic and configured to extend and retract. For example, at least a portion of the cable may include a helical coil configured to extend as tension is applied to the cable and retract as tension is removed from the cable.
As readily appreciated and understood by those skilled in the art, the cable 16 may be provided with a releasable connector at one end, or alternatively, may be hard-wired directly to the corresponding electronics disposed within the alarm module 20 and/or the sensor 14. The end of the cable 16 that is connected to the alarm module 20 may be provided with a releasable connector (e.g., a plug connector) so as to facilitate the interchangeability of different alarm modules with the same sensor.

It is understood that the illustrated embodiment including an alarm module 20 is not intended to be limiting, as it is understood that the cable 16 may alternatively be tethered or electrically connected to other display surfaces, stands, supports, remote alarm modules, etc. In other embodiments, the cable 16 may be electrically connected between the sensor 14 and an external power source.

According to various embodiments shown in FIG. 4, a sensor 14 for protecting an item of merchandise from theft or unauthorized removal is shown. Generally, the sensor 14 may include a plunger switch 22 that is extendable and retractable. The plunger switch 22 may be biased to an extended position. As such, the plunger switch 22 may move from the extended position to a retracted or depressed position when the sensor 14 is engaged with the item of merchandise. In the depressed position, the switch completes an electronic sense loop or circuit in communication with the monitoring electronics disposed within the alarm module 20. In the event that a potential thief attempts to remove the sensor 14 from the item of merchandise, biased plunger switch 22 extends and interrupts the sense loop or circuit of the monitoring electronics to indicate that the sensor is no longer securely engaged with the item of merchandise. In response to the plunger switch 22 changing from a “secured” state to an “unsecured” or “alarm” state, the monitoring electronics of the alarm module 20 may activate the audible alarm and/or visible alarm to alert store personnel to a possible theft.

In other embodiments, the sensor 14 may include a lasso or loop at its end, which is sized to allow the alarm module 20 to be positioned through the loop. Thus, the loop sensor may be configured to be inserted through an opening in an item of
merchandise and then the alarm module may be inserted through the opening in the loop. In one embodiment, the sensor 14 and/or the alarm module 20 also includes a light-emitting device (LED) or the like that is configured to indicate a status of the security system. For example, the LED may indicate that the monitoring electronics is armed or alarming.

[0013] FIGS. 11-13 show one embodiment of a sensor 14. As shown, the sensor 14 may include a flange 18. In some cases, the flange 18 is circular in shape, although other shapes may be employed if desired. The sensor 14 may also include a head member 26 (e.g., an over molding) that is operably engaged with the cable 16 via a strain relief member 28. FIG. 13 shows that the longitudinal axis of the cable 16 may be offset from a plane that the flange 18 resides in. The head member 26 may project outwardly from a surface of the flange member 18. The head member 26 may have a smaller cross-sectional dimension, such as a smaller diameter than the flange 18. The sensor 14 may also include an adhesive 24, such as a releasable adhesive, that is secured to the flange 18 opposite the head member 26. The adhesive 24 may correspond to the shape of the flange 18 and include an opening for receiving the plunger switch 22. The adhesive 24 may be used to secure the sensor 14 to an item of merchandise. In some cases, at least a portion of the adhesive 24 may be a “peel-and-stick” configuration for adhering to the item of merchandise. However, it is understood that other suitable techniques may be used to secure the sensor in position on the item of merchandise.

[0014] FIGS. 5-10 illustrate an embodiment of a connection member 30 configured to attach the sensor 14 to an item of merchandise. The connection member 30 may include a rigid component 32 and a flexible component 34. In general, the rigid component 32 and the flexible component 34 are configured to receive a portion of the sensor 14 therein for securing the sensor to the item of merchandise. The flexible component 34 is configured to attach to a surface of the item of merchandise. The flexible component 34 may include an adhesive 42, such as a releasable adhesive, for attachment to the item of merchandise. In some embodiments, the rigid component 32 and the flexible component 34 each comprises a slot 38 that is configured to receive a portion of the sensor 14
therein. Moreover, the rigid component 32 and/or flexible component 34 may include a recess 40 for receiving a portion of the sensor therein, and in particular, the flange 18 of the sensor. Thus, the recess 40 and the flange 18 may have a similar size and shape. In addition, the width of the slot 38 may be less than a diameter of the recess 40. In some cases, the rigid member 32 is generally hollow for defining a recess 40. In one embodiment, each of the rigid component 32 and the flexible component 34 defines a recess that is configured to align with one another for receiving the flange 18 therein. The flange 18 may snap fit into engagement with the connection member in some embodiments. As shown in FIG. 6, the flange 18 may be configured to be received within the recess 40 such that a bottom surface of the sensor 14 and the flexible component 34 align with one another.

[0015] Moreover, the rigid component 32 may be raised or extend outwardly from a surface of the flexible component 34 opposite to the adhesive 42. In one example, the flexible component 34 extends laterally outward from the rigid component 32. The flexible component 34 may be disposed on opposite sides of the rigid component 32 in a “wing” configuration. It is understood that various sizes and configurations of the connection member 30 may be employed in alternative embodiments.

[0016] The rigid component 32 and the flexible component 34 may be secured together to form a single unitary connection member 30. The rigid component 32 may be attached to the flexible component 34 using various techniques. For example, the rigid component 32 may be attached to the flexible component via welding, such as ultrasonic welding. The rigid component 32 may be attached to various locations on the flexible component 34, but in one embodiment, the rigid component is secured to an outer surface of the flexible component. In some embodiments, the connection member 30 is disposable or capable of one-time use such that the sensor 14 may be used with different connection members.

[0017] The flexible component 34 facilitates a secure connection between the sensor 14 and a surface of the item of merchandise that may not be flat. In particular, the
flexible component 34 is configured to conform to various surface contours of the item of merchandise, including curved surfaces. In addition, the flexible component 34 may at least double or at least triple the adhesive surface area of the sensor 14. Thus, the flexible component 34 may provide a more secure attachment between the sensor 14 and the item of merchandise, which may reduce the incidence of false alarms.

[0018] The foregoing has shown and described one or more embodiments of a merchandise display security device. Many modifications and other embodiments of the invention will be readily apparent to one skilled in the art having the benefit of the teachings presented in the foregoing description and accompanying drawings. Therefore, it is to be understood that the invention is not limited to the embodiments shown and described herein and that variations of and modifications to the disclosed embodiments, as well as undisclosed embodiments within the ordinary skill of the art, are intended to be included within the content and scope of the appended claims.
That which is claimed is:

1. A security system for securing an item of merchandise from theft or unauthorized removal, the security device comprising:
   - a cable;
   - a sensor operably engaged with the cable;
   - an alarm module operably engaged with the cable; and
   - a connection member configured to attach the sensor to an item of merchandise,
   wherein the connection member comprises a rigid component configured to receive a portion of the sensor therein and a flexible component attached to the rigid member and configured to attach to the item of merchandise,
   wherein the cable comprises at least one conductor electrically connected to the sensor and the alarm module for defining a sense loop,
   wherein the alarm module is configured to generate an alarm signal in response to interruption of the sense loop.

2. The security system of Claim 1, wherein the flexible component further comprises an adhesive for securing the flexible component to the item of merchandise.

3. The security system of Claim 1, wherein interruption of the sense loop is indicative of cutting the cable and/or unauthorized removal of the sensor from the item of merchandise.

4. The security system of Claim 1, wherein the cable is hardwired to the alarm module and the sensor.

5. The security system of Claim 1, wherein the rigid component is welded to the flexible component.

6. The security system of Claim 1, wherein the rigid component is ultrasonically welded to the flexible component.
7. The security system of Claim 1, wherein the flexible component extends laterally outward from the rigid component.

8. The security system of Claim 1, wherein the flexible component is disposed on opposite sides of the rigid component.

9. The security system of Claim 1, wherein the rigid component and the flexible component each comprises a slot for receiving a portion of the sensor.

10. The security system of Claim 1, wherein the sensor comprises a flange and the flexible component comprises a recess configured to receive the flange therein.

11. The security system of Claim 10, wherein the rigid component comprises a recess aligned with the recess in the flexible component that is configured to receive the flange therein.

12. The security system of Claim 1, wherein the rigid component is secured to an outer surface of the flexible component.

13. A method for securing an item of merchandise from theft or unauthorized removal, the method comprising:

   attaching an alarm module to a support surface;

   attaching a connection member to a sensor, wherein the connection member comprises a rigid component configured to receive a portion of the sensor therein and a flexible component attached to the rigid member; and

   attaching the sensor and the flexible component to the item of merchandise, a cable connected to the alarm module and the sensor and comprising at least one conductor for defining a sense loop, wherein the alarm module is configured to generate an alarm signal in response to interruption of the sense loop.

14. The method of Claim 13, wherein attaching the connection member comprises inserting a portion of the sensor through a slot defined in the connection member.
15. The method of Claim 13, wherein attaching the connection member comprises inserting a portion of the sensor within a recess defined in the connection member.
ABSTRACT

A security system for securing an item of merchandise from theft or unauthorized removal is provided. The security system includes a cable and a sensor at one end of the cable. The security system also includes an alarm module operably engaged with the cable and a connection member configured to attach the sensor to an item of merchandise. The connection member comprises a rigid component configured to receive a portion of the sensor therein and a flexible component attached to the rigid member and configured to attach to the item of merchandise. The cable comprises at least one conductor electrically connected to the sensor and the alarm module for defining a sense loop, and the alarm module is configured to generate an alarm signal in response to interruption of the sense loop.