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SHELF SWEEP SECURITY SYSTEM

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SHELF SWEEP SECURITY SYSTEM

BACKGROUND OF THE INVENTION

[0001] Embodiments of the present invention relate generally to merchandise security devices, systems, and methods, including devices, systems, and methods for protecting merchandise from theft in a retail environment.

[0002] Retailers display merchandise for consumers in a manner that allows consumers to decide whether to purchase the item while at the same time reducing the incidence of theft. Some merchandise is displayed in a manner that allows a consumer to take more than one product at a time for purchase. In some instances, removal of more than one item of merchandise at a time may be indicative of theft. Thus, retailers may benefit from techniques for preventing such theft while at the same time presenting the merchandise in a way that encourages a consumer to purchase the item.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0003] Referring to the accompanying figures wherein identical reference numerals denote the same elements throughout the various views, the illustrated embodiments of methods and systems according to the present invention are capable of protecting an item of merchandise against theft or unauthorized removal, and may also be capable of monitoring merchandise in a retail environment. The item of merchandise 12 may be any item, including any number of consumer products. The items of merchandise 12 may be packaged (or boxed) or non-packaged items. The system, indicated generally at 10, is operable for securing items of merchandise 12 from theft and/or monitoring items of merchandise (see, e.g., FIG. 1). Although described in relation for use in a retail environment, the system 10 shown and described herein is suitable for monitoring and/or securing an item of merchandise 12 in other settings, such as for example, a residential or commercial environment, and is not intended to be limited to use only as a system for protecting against theft and/or unauthorized removal in a retail environment.

[0004] According to one embodiment, the system 10 generally comprises a rail 14 configured to be secured to a shelf 16. Any number of rails 14 may be employed on a shelf 16

depending on the size of the merchandise, type of shelving, and planogram of the retail store. In some embodiments, the shelf 16 is a conventional shelf, and the rail 14 is configured to be adapted to the shelf, such as by attachment with fasteners and/or adhesive. In other embodiments, the rail 14 may be integrated within the shelf 16 itself. The rail 14 may be of a low profile so as to not take away significantly from the footprint of the shelf 16 or otherwise materially affect the available space on or between shelves. For example, the rail 14 may have a large aspect ratio in relation of its width to its thickness (e.g., an aspect ratio greater than 5). In one embodiment, the rail 14 is not a display or locking hook or rod that is conventionally supported on a display surface such as pegboard or slat wall.

[0005] In one embodiment, a slot 20 is defined in the rail 14 and is configured to receive a tag 22 attached to an item of merchandise 12. The tag 22 may be attached to the merchandise 12 using various means such as adhesive and/or one or more cables. In one example, the tag 22 is attached to a bottom surface of the item of merchandise 12 as illustrated in FIG. 3. The tag 22 may be disposable in some cases and could be removed by authorized personnel at the time of sale of the item of merchandise 12. In one example, the tag 22 includes an EAS tag or element configured to cause an alarm if the tag is moved through a particular zone or gate. The tag 22 is configured to slide along the rail 14 while engaged with the slot 20. One end 24 of the slot 20 may be enlarged for at least partially receiving the tag 22 therein. In some cases, both the tag 20 and the enlarged end 24 may be circular in shape, although other shapes may be used in other embodiments. As shown in FIG. 1, the slot 20 may be configured to receive a plurality of tags 22 and arrange the tags linearly along the rail 14. This linear arrangement may allow for a neat and orderly appearance of the items of merchandise 12 on the shelf 16. However, it is understood that the rail 14 and/or slot 20 may have different shapes in other embodiments.

[0006] As shown in FIG. 3, the tag 22 may have a “stepped” shape whereby an upper member 26 is separated by a lower member 28 with a neck 30. In some cases, the neck 30 is smaller in cross section than both the upper 26 and lower 28 members. The upper member 26 may have a larger cross section than the lower member 28. FIG. 5 illustrates an embodiment of a cross section of the rail 14 wherein the slot 20 is T-shaped. In this way, the slot 20 is configured to receive the lower member 28 of the tag 22, while the upper member 26 is configured to rest on

top of the rail adjacent to the slot 20. In this way, the tag 22 is configured to slide along the rail while remaining in engagement therewith. Only when the tag 22 reaches the enlarged end 24 is the tag 22 able to be removed from the slot 20. As such, a customer is required to slide each item of merchandise 12 along the rail 14 and remove each tag 22 and attached item of merchandise out of the slot 20. Due to the shape and configuration of the slot 20 and the tag 22, a potential thief is unable to simultaneously sweep all items of merchandise 12 off of the shelf 16. Moreover, a significant portion of the tag 22 may be hidden from view when placed within the slot 20 which does not take away from the appearance item of merchandise 12.

[0007] FIGS. 6-8 illustrate that the rail 14 may include a lock mechanism 32 in some embodiments. The lock mechanism 32 may be configured to limit or prevent removal of the tags 22 from the rail 14. For example, the lock mechanism 32 may be configured to only allow one tag 22 to be removed from the rail 14 at a time before the lock mechanism is engaged to thereby prevent additional tags from being removed. The lock mechanism 32 may include a pivot member 34 located within the slot 20 that is configured to rotate as a tag 22 moves through the slot and engages the pivot member. For instance, when a tag 22 is being slid towards the pivot member 34, the tag 22 may engage the pivot member and cause the pivot member to rotate. For purposes of illustration, FIG. 7 shows the pivot member 34 in an unlocked position 34A and a locked position 34B. Thus, in the unlocked position 34A, the tag 22 is able to be moved to the enlarged end 24, and as the tag engages the pivot member, the pivot member moves in a clockwise direction to the locked position 34B. As such, a second tag 22 is unable to be removed in sequence without first moving the pivot member 34 back to the unlocked position 34A. When the pivot member 34 is in the locked position 34B, a tag 22 may be configured to be reinserted within the enlarged end 24 and slid along the slot 20 to engage the pivot member 34 to cause the pivot member to move counterclockwise back to the unlocked position 34A. Thus, in the locked position 34B, a tag 22 may be added to the rail 14.

[0008] In some embodiments, the lock mechanism 32 may include a latch 36 that is configured to lock the pivot member 34 in the locked 34A or unlocked 34B position. For example, the latch 36 may extend along a portion of the length of the rail 14 and when actuated in a first linear direction, the pivot member 34 is locked in the locked position 34B, but when

actuated in a second opposite linear direction, the pivot member is locked in the unlocked position 34A. It is understood that various mechanisms may be employed to lock the pivot member 34 in a desired position, including either or both mechanical and electrical mechanisms. In some cases, the lock mechanism 32 may be configured to automatically lock such as in response to a sweep event, or the lock mechanism may be automatically locked at particular times of day (e.g., after hours or at times of day with historically high theft rates). In some embodiments, the latch 36 extends along the entire length of the rail 14 and may be guided between predetermined locked and unlocked positions via one or more pins 42 engaged with the rail.

[0009] In one embodiment, the pivot member 34 may cooperate with a time-delay mechanism whereby upon removal of one tag 22 (or some predetermined number of tags), the pivot member 34 is locked in the locked position 34B for a predetermined period of time. Following this predetermined period of time, the pivot member 34 is moved back to the unlocked position 34A. In this way, a potential thief is unable to serially remove tags 22 from the rail 14 in a short period of time or simultaneously.

[0010] It is understood that the rail 14 may include an internal alarm or communicate with an external alarm. Thus, the rail 14 may be configured to generate an alarm (e.g., an audible and/or visible signal) or cause an alarm to be generated if a predetermined number of tags 22 are removed from the rail that is indicative of theft.

[0011] One or more rails 14 may be configured to communicate with a monitoring device 40 to receive or communicate various information. For instance, the rail 14 may communicate with the monitoring device regarding inventory information so that the retailer is aware of the number of tags 22 located on each rail. The monitoring device 40 could also be used to generate an alarm and/or actuate the lock mechanism 32. Thus, the alarm and/or the lock mechanism 32 may be actuated remotely in some cases. The system 10 may further include the capability of providing alerts to authorized personnel when particular events occur in some embodiments. For example, the system 10 may be configured to notify authorized personnel and/or generate an alarm in response to a potential thief being within proximity to the system 10, or detecting the potential thief's portable electronic device (e.g., detecting the Wi-Fi MAC address of the

portable electronic device).

[0012] The rail 14 and monitoring device 40 may include wireless communications circuitry for communicating with one another using any desired communications protocol (e.g., Bluetooth, Wi-Fi, radiofrequency, etc.). The rail 14 and monitoring device 40 may be located remotely from one another. For example, the monitoring device 40 may be located at some fixed location in proximity to one or more rails 14. The rail 14 and/or the monitoring device 40 may have a power source for providing power for operating the wireless communications circuitry, as well as any other components requiring power. Furthermore, it is understood that the rail 14 and monitoring device 40 may communicate via wired means if desired.

[0013] In some embodiments, a monitoring device 40 may be configured to be paired with one or more rails 14. For example, a plurality of rails 14 may be paired with one monitoring device 40. Thus, the monitoring device 40 may be configured to monitor a plurality of signals provided by the rails 14 and to determine if a theft event has occurred. In some instances, each rail 14 may be wirelessly paired to a monitoring device 40, such as, for example, via Bluetooth communication. Pairing may include the exchange of a particular code or identifier that associates a rail 14 with a monitoring device 40. An authorized user may initiate communication between a rail 14 and a monitoring device 40 for pairing or unpairing with one another. Therefore, any number of rails 14 may be added to or removed from the system 10, and likewise a plurality of monitoring devices 40 may be employed.

[0014] In another embodiment, the system 10 may be utilized for inventory control. For instance, the monitoring device 40 may be configured to monitor a number of items of merchandise on a rail 14 based on input from the rail or a sensor associated with the rail and alert authorized personnel should the inventory fall below a predetermined number. The monitoring device 40 may further be configured to facilitate communication with one or more remote devices for providing notification regarding inventory levels. Such communication could occur, for instance, over a cloud network. In other embodiments, the rail 14 and/or the monitoring device 40 may be configured to generate an alarm should the inventory fall below a predetermined level.

[0015] The foregoing has described one or more embodiments of systems and methods for

securing item of merchandises from theft or unauthorized removal. Although embodiments of the present invention have been shown and described, it will be apparent to those skilled in the art that various modifications thereto can be made without departing from the spirit and scope of the invention. Accordingly, the foregoing description is provided for the purpose of illustration only, and not for the purpose of limitation.

That which is claimed is:

1. A system for securing items of merchandise from theft on a shelf in a retail environment, the system comprising:

a plurality of tags, each of the tags configured to be attached to a respective item of merchandise; and

a rail provided on a shelf, the rail configured to receive each of the plurality of tags and to guide each of the plurality of tags from a display position whereby the plurality of tags cannot be removed from the rail to a position whereby each of the plurality of tags is removable from the rail.

2. The system of Claim 1, further comprising a plurality of rails.

3. The system of Claim 1, wherein the rail is configured to be attached to the shelf.

4. The system of Claim 1, wherein the rail is integrated with the shelf.

5. The system of Claim 1, wherein the rail comprises a slot configured to receive a portion of the tag therein.

6. The system of Claim 5, wherein the slot extends linearly.

7. The system of Claim 5, wherein the slot comprises an enlarged end for receiving each of the plurality of tags therein.

8. The system of Claim 5, wherein the slot comprises a T-shaped cross section.

9. The system of Claim 5, wherein each of the plurality of tags is configured to slide within the slot.

10. The system of Claim 1, wherein the tag comprises a circular cross section.

11. The system of Claim 1, wherein the rail further comprises a pivot member configured to move between an unlocked and a locked position as one of the plurality of tags is removed from the rail.

12. The system of Claim 9, further comprising a latch configured to lock the pivot member in the locked position.

13. The system of Claim 1, further comprising wireless communications circuitry contained within the rail.

14. The system of Claim 13, further comprising a monitoring device configured to

wirelessly communicate with the rail.

15. The system of Claim 14, wherein the rail or the monitoring device is configured to generate an alarm.

16. A method for monitoring a pusher device in a retail environment, the method comprising:

attaching each of a plurality of tags to a respective item of merchandise; and

inserting each of the tags within a rail provided on a shelf, the rail configured to guide each of the plurality of tags from a display position whereby the plurality of tags cannot be removed from the rail to a position whereby each of the plurality of tags is removable from the rail.

ABSTRACT

Shelf sweep security device, systems, and methods for securing items of merchandise from theft and are provided. In one example, a system includes a plurality of tags, wherein each of the tags is configured to be attached to a respective item of merchandise. The system also includes a rail configured to receive each of the plurality of tags and to guide each of the plurality of tags from a display position whereby the plurality of tags cannot be removed from the rail to a position whereby each of the plurality of tags is removable from the rail.



FIGURE 1

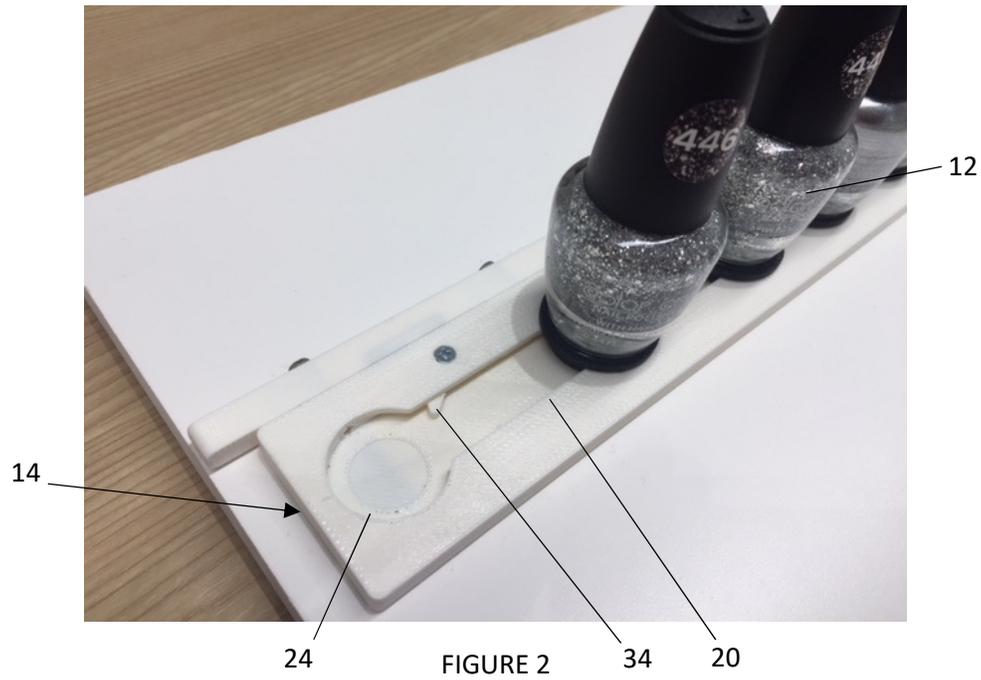


FIGURE 2



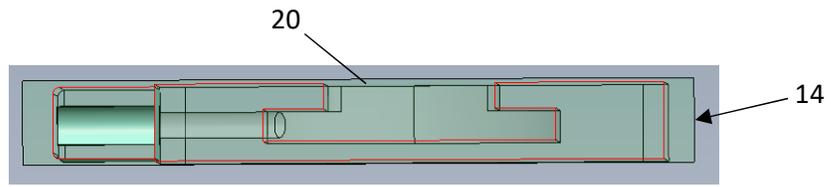


FIGURE 5

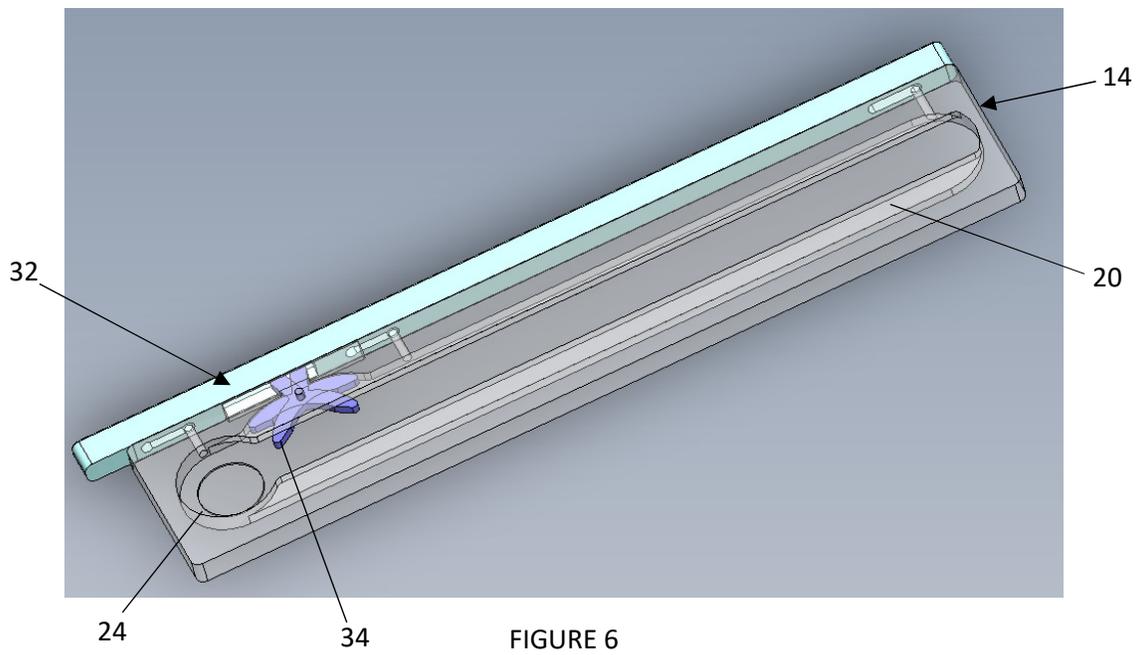


FIGURE 6

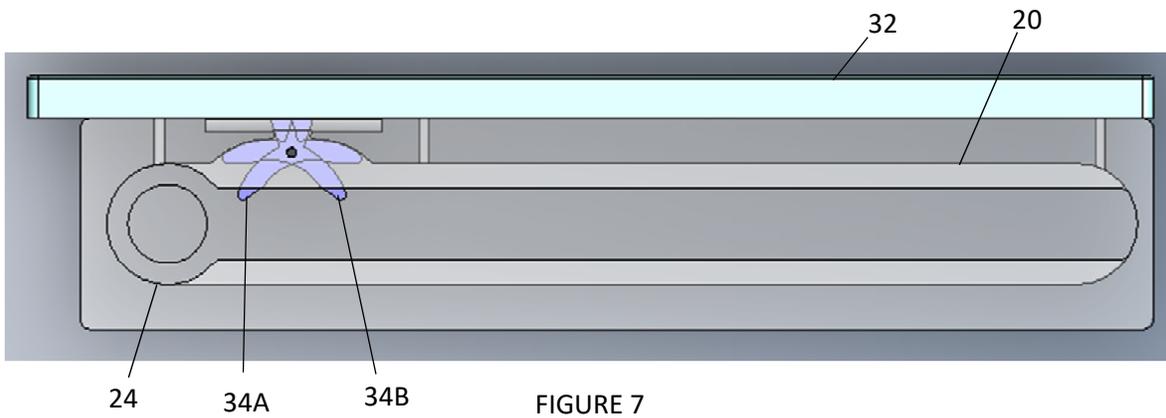


FIGURE 7



FIGURE 8