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SHELF SWEEP DETECTOR

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SHELF SWEEP DETECTOR

BACKGROUND OF THE INVENTION

[0001] Embodiments of the present invention relate generally to merchandise security, including systems and methods for monitoring and 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 detecting such theft while at the same time presenting the merchandise in a way that encourages a consumer to purchase the item. Retailers may further benefit from techniques for monitoring inventory of items of merchandise.

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 not only protecting an item of merchandise against theft or unauthorized removal, but also for 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. Although described in relation for use in a retail environment, the system 10 shown and described herein is suitable for monitoring and 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 pusher device 14,

a sweep detector 16, and a monitoring device 18. In some embodiments, the pusher device 14 is a conventional or off-the-shelf device, and the sweep detector 18 is modular and is configured to be adapted to the pusher device. Generally, the pusher device 14 includes a pusher 20 and a biasing member 22 whereby the pusher is configured to bias the pusher towards a particular position. The pusher device 14 may further include a rail member 24 and a stop member 26 in some applications. The pusher 20 is configured to abut one or more items of merchandise and move along the rail member 24, while the biasing member 22 is configured to bias the pusher towards the stop member 26 at an end of the rail member. The items of merchandise may thus be disposed between the pusher 20 and the stop member 26 in a relaxed state. As items of merchandise are removed, the pusher 20 is biased towards the stop member 26. The pusher device 14 may be located on a shelf in a retail environment, and the pusher 20 may be configured to move the items of merchandise under the force of the biasing member 22 for presenting the items of merchandise to consumers. For example, the biasing member 22 may be clock spring, power spring, flat spiral spring, or the like. Thus, as merchandise is added to the pusher device 14, the clock spring is configured to unwind (see, e.g., FIG. 6), and as merchandise is removed to the pusher device, the clock spring is configured to wind (see, e.g., FIG. 5). It is understood that the sweep detector 16 may be configured for use with a variety of types of pusher devices, such as the pusher device described above. For instance, pusher devices may be utilized on shelves, display hooks, and the like for presenting merchandise to a consumer. In the case of a display hook, the pusher 20 may be configured to move along a rod under the bias of biasing member 22, and the end of the rod may include a bend or like stop member.

[0005] The sweep detector 16 and monitoring device 18 may include wireless communications circuitry for communicating with one another using any desired communications protocol (e.g., Bluetooth, Wi-Fi, radiofrequency, etc.). The sweep detector 16 and monitoring device 18 may be located remotely from one another. For example, the monitoring device 18 may be located at some fixed location in proximity to one or more sweep detectors 16. The sweep detector 16 and/or the monitoring device 18 may have a power source 36 for providing power for operating the wireless communications circuitry, as well as any other components requiring power. Furthermore, it is understood that the sweep detector 16 and

monitoring device 18 may communicate via wired means if desired.

[0006] Advantageously, the sweep detector 16 is configured to be removably attached to the pusher device 14 in a manner that does not hinder the operation of the pusher device. In one example, the sweep detector 16 comprises a housing 28 that is configured to engage the pusher 20. For example, the housing 28 may be snap fitted to the pusher and/or secured with a fastener (e.g., an adhesive). The housing 28 may be configured to enclose the pusher 14 in some embodiments. When attached to the pusher, the sweep detector 16 is configured to move with the pusher 20.

[0007] In one embodiment, the sweep detector 16 may include a sound generator 30. The sound generator 30 may be at least partially enclosed within the housing 28. In some cases, the sound generator 30 may be attached to the housing 28. In some instances, the sound generator 30 may be configured to generate a sound and/or signal in response to movement of the pusher 20. For example, movement in one direction may generate a first sound and/or signal while movement in an opposite direction may generate a second sound and/or signal. These sounds or signals may be indicative of removing or loading the items of merchandise. The sounds or signals may be distinguishable in volume, frequency, and/or intensity from other ambient or spurious signals, and may be audible in some embodiments. For instance, the sound generator 30 may generate a “click” sound. In some instances, the sound generator 30 is configured to generate sound in a predetermined pattern or sequence in response to removal of an item of merchandise from the pusher 20. The monitoring device 18 may be configured to detect the sound pattern or sequence and to determine if a predetermined number of items of merchandise have been removed from the pusher device.

[0008] In one embodiment, the sound generator 30 may be in the form of a switch or a rotatable device that is configured to generate a sound and/or signal with each revolution. Different sizes of rotatable devices could be used for different sized packages so that each revolution corresponds to removal of one item of merchandise M. In some cases, the sound generator 30 may be adjustable to account for different sizes of items of merchandise. For instance, the sound generator 30 may be set up to generate a sound and/or signal in a desired linear distance movement of the pusher 20. The sound generator 30 may have graduations or

guides to facilitate correlation between a size of the item of merchandise M.

[0009] In some embodiments, the sound(s) and/or signal(s) generated by the sound generator 30 may be configured to be transmitted to the monitoring device 18. These sounds and/or signals may be processed by the monitoring device 18 for determining whether a predetermined number of items of merchandise have been added or removed. For example, the monitoring device 18 may be configured to determine that a predetermined number of items of merchandise M have been removed in a predetermined period of time. Once the items of merchandise are loaded on the pusher device 14, removal of a predetermined number of items within a predetermined period of time may be indicative of a theft or “sweep”. For instance, removal of a plurality of items of merchandise within a specified time period may be indicative of theft or sweep, while removal of one item of merchandise is not indicative of theft or sweep. The predetermined number of items of merchandise that is indicative of theft may be input by authorized personnel at the monitoring device 18 or may be preset by the manufacturer. The sweep detector 16 and/or the monitoring device 18 may have an alarm that is configured to generate an alarm signal (e.g., an audible and/or visible signal) as a result of such removal.

[0010] In some embodiments, a plurality of sweep detectors 16 may communicate with one monitoring device 18. Thus, the monitoring device 18 may be configured to monitor a plurality of sounds and/or signals provided by the sweep detectors 16 and to determine if a theft event has occurred. In some instances, each sweep detector 16 may be wirelessly paired to a monitoring device 18, such as, for example, via Bluetooth communication. Pairing may include the exchange of a particular code or identifier that associates a sweep detector 16 with a monitoring device 18. An authorized user may initiate communication between a sweep detector 16 and a monitoring device 18 for pairing or unpairing with one another, such as by pressing an actuator on the sweep detector and/or the monitoring device. Therefore, any number of sweep detectors 16 may be added to or removed from the system 10, and likewise a plurality of monitoring devices 18 may be employed.

[0011] In another embodiment, the system 10 may be utilized for inventory control. For instance, the monitoring device 18 may be configured to monitor a number of items of merchandise on a pusher device 14 based on input from the sound generator 30 and alert

authorized personnel should the inventory fall below a predetermined number. The monitoring device 18 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 sweep detector 16 and/or the monitoring device 18 may be configured to generate an alarm signal should the inventory fall below a predetermined level.

[0012] 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 sweep detector system for monitoring a pusher device in a retail environment, the pusher device configured to dispense one or more items of merchandise, the sweep detector comprising:

a sound generator configured to be coupled to the pusher device, the sound generator configured to generate a sound in response to removal of an item of merchandise from the pusher device; and

a monitoring device configured to detect the sound and to determine if a predetermined number of items of merchandise have been removed from the pusher device.

2. The sweep detector system of Claim 1, wherein the sound generator is configured to generate a sound in a predetermined pattern or sequence in response to removal of an item of merchandise from the pusher device.

3. The sweep detector system of Claim 2, wherein the monitoring device is configured to detect the predetermined sound pattern or sequence and to determine if a predetermined number of items of merchandise have been removed from the pusher device.

4. The sweep detector system of Claim 1, wherein the sound generator comprises a switch or rotatable device for generating the sound.

5. The sweep detector system of Claim 1, wherein the sound generator is modular and is configured to be attached to a pusher of the pusher device.

6. The sweep detector system of Claim 1, wherein the monitoring device comprises an alarm for generating an alarm signal if a predetermined number of items of merchandise have been removed from the pusher device.

7. The sweep detector system of Claim 1, further comprising a plurality of sound

generators, each sound generator coupled to a respective pusher device.

8. The sweep detector system of Claim 7, wherein the monitoring device is configured to communicate with each of the plurality of sound generators.

ABSTRACT

Sweep detectors, systems, and methods for securing items of merchandise from theft and are provided. In one example, a sweep detector system includes a sound generator configured to be coupled to the pusher device. The sound generator is configured to generate a sound in response to removal of an item of merchandise from the pusher device. The sweep detector system also includes a monitoring device configured to detect the sound and to determine if a predetermined number of items of merchandise have been removed from the pusher device.



FIGURE 1

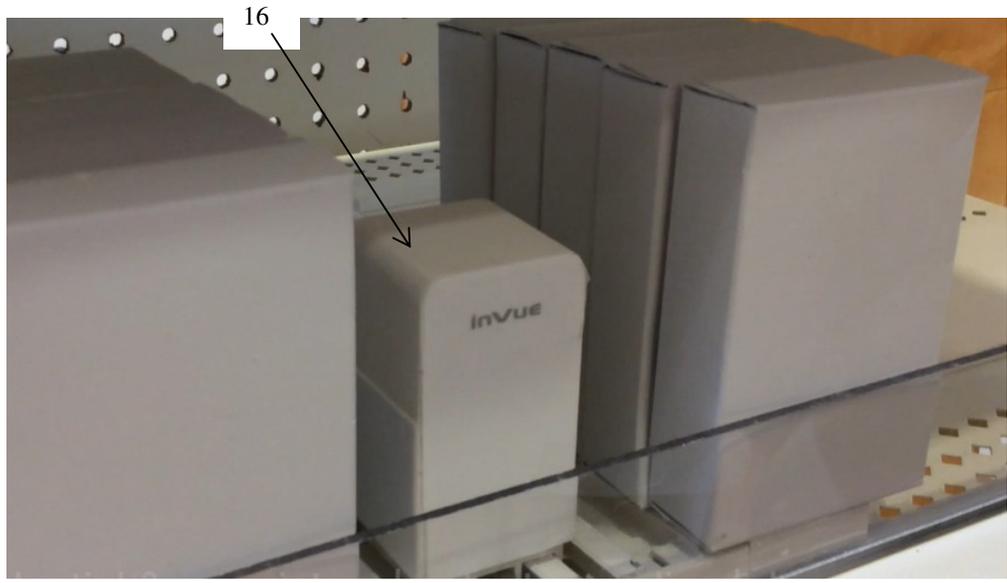


FIGURE 2



FIGURE 3

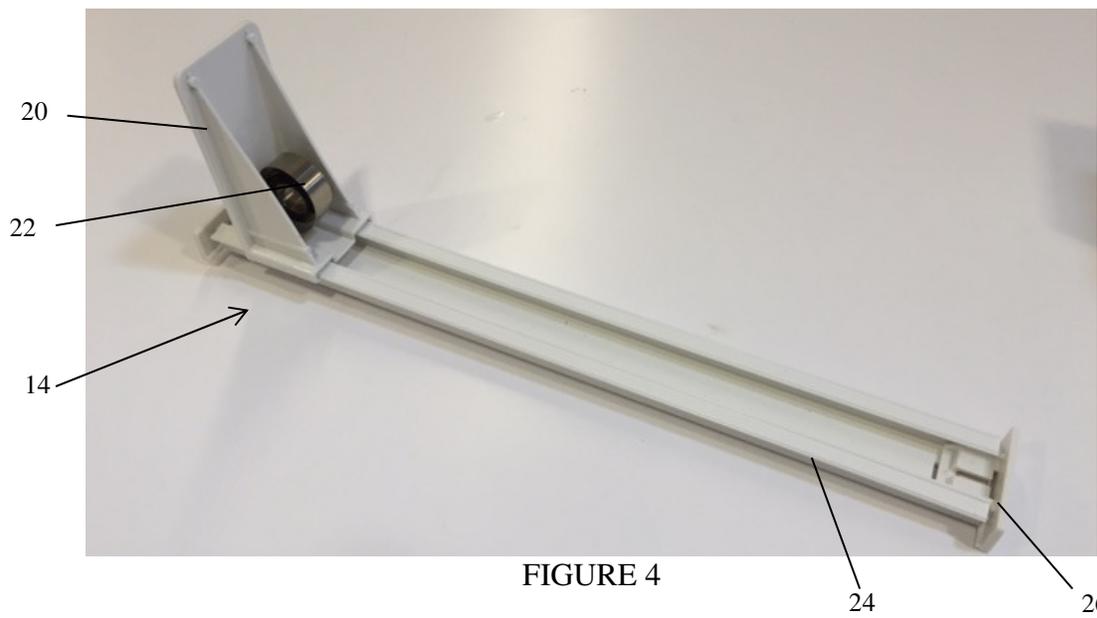


FIGURE 4

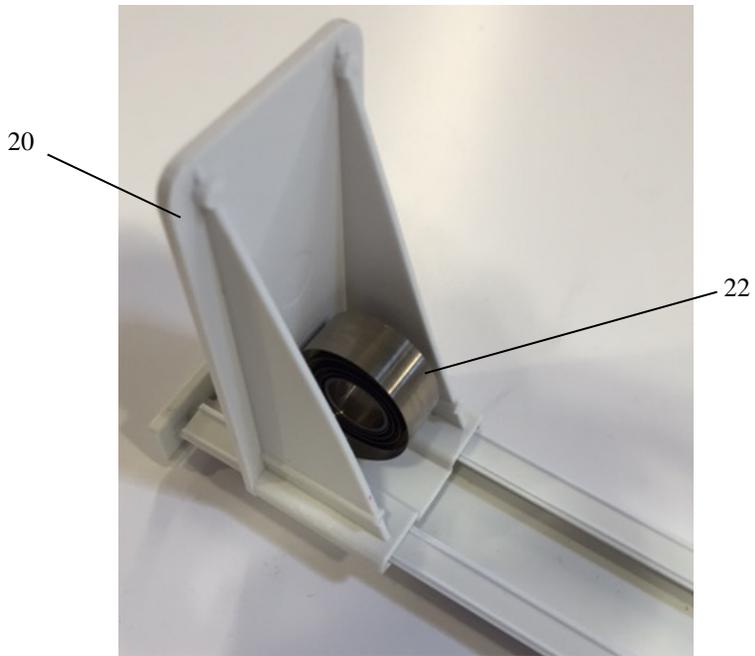


FIGURE 5

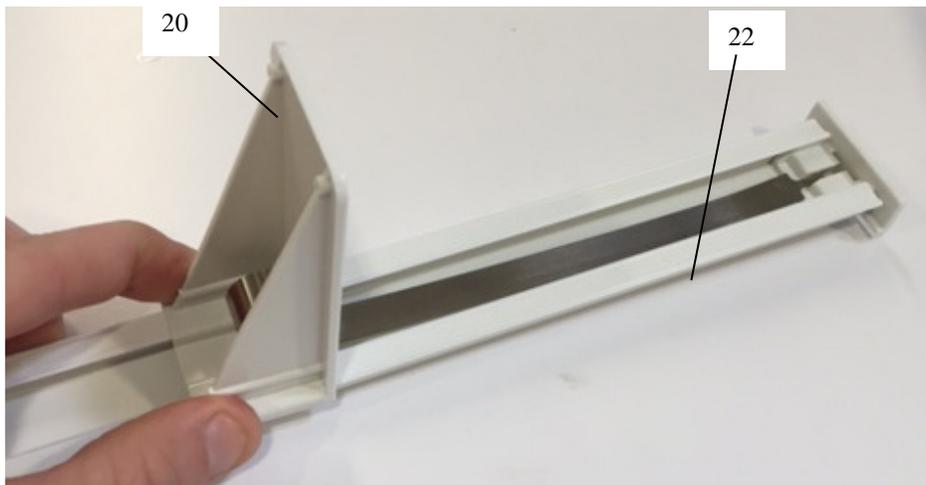


FIGURE 6

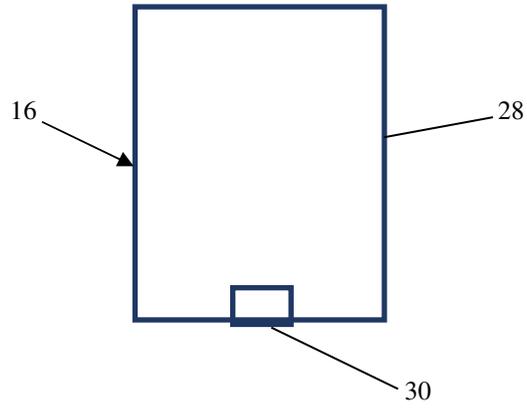


FIGURE 7