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SYSTEMS, APPARATUSES AND METHODS FOR A TIERED STRUCTURE TO MANAGE A CHAIN OF CUSTODY FOR PACKAGE DELIVERY

Abstract

The present disclosure relates to systems, apparatuses and methods for a tiered structure to manage a chain of custody for package delivery. More particularly, this disclosure describes a last mile transporter for package deliveries whereby package whereabouts are monitored through transmitters. In an illustrative embodiment, a vehicle, last mile transporter, and container each have a transmitter. The three transmitters may be used for tracking a package that is placed in the container. A chain of custody may be created when the at least one package is placed in the container. The container may be placed atop the last mile transporter. There is thus a relationship between the container and the transporter. In turn, the vehicle may also be in communication with the container and the transporter. Each device may be used to manage the package location through their appropriate transmitters.

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Background/Summary

BACKGROUND

[0001] Package thefts may occur at any point within a chain of custody. Typically, packages may be loaded at a transfer hub into a vehicle. The vehicle may then drive to a location where the packages are delivered. Delivery typically occurs when it is placed at the destination. At any point, these packages may be subjected to theft. At its core, chain of custody refers to the documentation and procedures ensuring the accurate and secure handling of transported goods from origin to destination.

[0002] When thefts occur, it is hard to identify at what point in the chain of custody it may have occurred. For example, between destinations, the package may have been stolen when the vehicle that the package is in is taken while the person delivering the package is out on another delivery. Thefts may also occur on the door step of a victim.

[0003] The present disclosure provides for systems, apparatuses and methods for a tiered structure to manage a chain of custody for package delivery that addresses the above identified concerns. Other benefits and advantages will become clear from the disclosure provided herein and those advantages provided are for illustration. The statements in this section merely provide the background related to the present disclosure and does not constitute prior art.

BRIEF DESCRIPTION

[0004] This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the DESCRIPTION OF THE DISCLOSURE. This summary is not intended to identify key features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

[0005] In accordance with one aspect of the present disclosure, a vehicle is provided that may include a transmitter, at least one processor, and a memory operatively coupled to the processor, the memory storing program instructions that when executed by the processor, causes the processor to perform processes. The processes may include connecting the vehicle with a last mile transporter, wherein the last mile transporter is coupled to a container for housing at least one package. The transmitter may provide a chain of custody of the at least one package between the vehicle, last mile transporter, and the container.

[0006] In accordance with another aspect of the present disclosure, a system is provided that may include a transmitter on a transporter and a transmitter on a container, the container for placement on the transporter. In addition, the system may include a management system in communication with the transmitter on the transporter and the transmitter on the container for creating a record of ownership for at least one package placed within the container from an origin to a destination.

[0007] In accordance with yet another aspect of present disclosure, a method for managing a location of a package is provided. The method may include receiving an identifier of the package, associating a container for which the package has been inserted into with a record, associating a last mile transporter for which the container has been placed onto with the record, and transmitting the record for managing the location of the package.

Description

BRIEF DESCRIPTION OF DRAWINGS

[0008] The novel features believed to be characteristic of the disclosure are set forth in the appended claims. In the descriptions that follow, like parts are marked throughout the specification and drawings with the same numerals, respectively. The drawing FIGURES are not necessarily drawn to scale and certain FIGURES may be shown in exaggerated or generalized form in the

interest of clarity and conciseness. The disclosure itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will be best understood by reference to the following detailed description of illustrative embodiments when read in conjunction with the accompanying drawings, wherein:

[0009] FIG. **1** is a schematic diagram of an initial pickup of packages and placement into corresponding containers in accordance with one aspect of the present disclosure;

[0010] FIG. **2** is a schematic diagram of scanning a package for placement into a specific slot of a container in accordance with one aspect of the present disclosure;

[0011] FIG. **3** is a schematic diagram of the container placement on a last mile transporter in accordance with one aspect of the present disclosure;

[0012] FIG. **4** is a schematic diagram showing packages from a vehicle placed onto the last mile transporter in accordance with one aspect of the present disclosure;

[0013] FIG. **5** is a schematic diagram showing transmissions from the vehicle, the container, and the last mile transporter holding the container in accordance with one aspect of the present disclosure;

[0014] FIG. **6** is a schematic diagram showing package delivery to its final destination in accordance with one aspect of the present disclosure;

[0015] FIG. **7** is a schematic diagram showing package pickups from its origin in accordance with one aspect of the present disclosure; and

[0016] FIG. **8** is a flow chart showing illustrative processes for providing a chain of custody for package delivery in accordance with one aspect of the present disclosure.

DESCRIPTION OF THE DISCLOSURE

[0017] The description set forth below in connection with the appended drawings is intended as a description of exemplary embodiments of the disclosure and is not intended to represent the only forms in which the present disclosure may be constructed and/or utilized. The description sets forth the functions and the sequence of blocks for constructing and operating the disclosure in connection with the illustrated embodiments. It is to be understood, however, that the same or equivalent functions and sequences may be accomplished by different embodiments that are also intended to be encompassed within the spirit and scope of this disclosure.

[0018] The present disclosure relates to systems, apparatuses and methods for a tiered structure to manage a chain of custody for package delivery. More particularly, this disclosure describes a last mile transporter for package deliveries whereby package whereabouts are monitored through transmitters. In an illustrative embodiment, a vehicle, last mile transporter, and container each have a transmitter. The three transmitters may be used for tracking a package that is placed in the container. A chain of custody may be created when the at least one package is placed in the container. The container may be placed atop the last mile transporter. There is thus a relationship between the container and the transporter. In turn, the vehicle may also be in communication with the container and the transporter. Each device may be used to manage the package location through their appropriate transmitters.

[0019] Numerous other modifications or configurations to the systems, apparatuses and methods for the tiered structure to manage the chain of custody for package delivery will become apparent from the description provided below. For example, while a vehicle, transporter and container were described for moving the package, hubs, which are centralized distribution points, may also provide documentary evidence for the chain of custody. Advantageously, managing a package's location may be more easily determined through the transmitters on each of the associated devices. Other advantages will become apparent from the description provided below.

[0020] The tiered structure relates to certain transmitters providing information, associating devices with one another, logging information in, and then providing it to a requesting party. Certain actions may warrant input into a record to maintain a chain of custody. The chain of custody relates to an association between the three devices as shown in Table 1 below:

TABLE-US-00001 TABLE 1 Transmitter Action Record Vehicle Load transporter into Associate transporter with (Top Tier) vehicle vehicle Transporter Unloaded from vehicle Associate transporter with (Middle Tier) vehicle and container Container Unfolded and loaded Associated container with (Bottom Tier) onto transporter transporter and/or vehicle.

[0021] Using tiers, the record associated with the chain of custody may be kept tracked of. For example, the Top Tier may maintain a number of Middle Tier Records, that is, the vehicle may maintain a number of last mile transporters. The Middle Tier may maintain a number of Bottom Tiers, which coincides with a last mile transports capable of handling a number of containers. The associations between the tiers may be communicated with one another through transmitters coupled to the vehicles, transporters, and containers.

[0022] With reference now to FIG. **1**, a schematic diagram **100** of an initial pickup of packages **102** and placement into corresponding containers **106***a*, **106***b*, and **106***c* (collectively containers **106**) in accordance with one aspect of the present disclosure is provided. The packages **102** may originate from a vendor or other party who wishes to transport their goods through the service described herein. The packages **102** may come in many different shapes, sizes, textures, colors and the like.

[0023] Typically, the packages **102** may originate from various locations. For example, the packages **102** may be set aside by a vendor for pickup. Packages **102** may also be provided by a manufacturer. The packages **102** may also be provided at hubs or may be picked up at a destination. For example, the package **102** may be set in front of a user's door for pickup by the handler **104**. Returns may be made through this.

[0024] An identifier, or other marker, may be associated with the packages **102**. When scanned, this information may be relayed to a management system. The handler **104** may use their scanning device, for example, a dedicated device, phone, tablet, or the like. Information may be shown to the handler **104** after it has been picked up on their device. This information may indicate which container **106** to place the package **102** into. For example, smaller and lighter packages **102** may be placed into one type of container **106***a* while heavier packages **102** may be placed into another type of container **106***c*.

[0025] Packages **102** may be placed into different containers **106** based on final destinations. The packages **102** may be grouped together based on geographic regions or another commonality. Packages **102** and containers **106** may also be dependent on the last mile transporter and how much it may hold.

[0026] When scanned and placed into a container, the package **102** may enter into a chain of custody for tracking the location of the package **102**. The location of the package **102** may be tracked when the package **102** is placed into the container as the container may include a transmitter. A management system connected with the transmitters may monitor the movement of a delivery. The system may monitor the packages **102** that are delivered or picked up by the transporter and associate them with the container **106**.

[0027] FIG. **2** is a schematic diagram **200** of scanning a package for placement into a specific slot **210***a*, **210***b*, **210***c*, **210***d*, **210***e* or **210***f* (collectively slots **210**) of a container **106** in accordance with one aspect of the present disclosure. To properly track packages, the handler **104** may place the packages into specific slots **210**. Depending on the scan of the item, different slots in the container may be opened automatically. The system may check an image of the package to determine whether it has been placed into the right slot of the container.

[0028] After identifying the package with a scanner **202**, the handler **104** may be given an indication of which slot **210** to place the package into. There may be a designated slot **210**. This designation may be based on the size of the package, final destination, or other criteria.

[0029] Slot information may be provided through a network **204**. The network **204** may be used to access servers, third party sites, and the like. Package configuration may be known once the package is scanned in by the handler **104**. Information about the container **106** may be accessed through the network **204**. Based on this, a proper slot **210** within the container **106** may be

identified to place the package into.
[0030] In one example, a hammer may fit only certain containers **106** having a unique slot **210***c*. This slot **210***c* may be padded such that the hammer would not cause damage to the integrity of the container **106**. This matching and analysis may be performed by the network **204**, for example, on the cloud. Communications may occur through the transmitter **206** to the network **204**.
[0031] Communications may occur across any type of wired or wireless system through a network **204** having any type of configuration, for example, a local area network (LAN), a personal area network (PAN), a wireless personal area network (WPAN), a wireless network (WAN), a wide area network (WAN), a metropolitan area network (MAN), a virtual private network (VPN), a cellular network, a token ring network, a point-to-point network, an ad hoc network, a mobile ad hoc network, a vehicular ad hoc network (VANET), a vehicle-to-vehicle (V2V) network, a vehicle-to-everything (V2X) network, a vehicle-to-infrastructure (V2I) network, vehicle to cloud communications, among others.
[0032] Computer communications may utilize any type of wired, wireless, or network communication protocol including, but not limited to, Ethernet (e.g., IEEE 802.3), Wi-Fi (e.g., IEEE 802.11), communications access for land mobiles (CALM), WiMAX, Bluetooth, Zigbee, ultra-wideband (UWAB), multiple-input and multiple-output (MIMO), telecommunications and/or cellular network communication (e.g., SMS, MMS, 3G, 4G, LTE, 5G, GSM, CDMA, WAVE), satellite, dedicated short range communication (DSRC), among others.
[0033] In one embodiment, the slots **210** may be automatically opened after being scanned. This may indicate to the handler **104** that the package should be placed into a specific slot **210**. Automated actuators may receive signals from a transmitter **206** on the container **106**. The slots **210** may be lowered when the package has been placed into the appropriate slot **210**. More than one slot **210** may open at a time. A layout of where to place the package may also be shown on the scanner **202**.
[0034] In one embodiment, the container **106** may have a front opening **208**. Through this opening **208**, the handler **104** may be used to load the entirety of the packages at once. This might be easier to load the container **106** when there are numerous packages that need to be fit within the container **106**. The information may be automatically communicated through the transmitter **206** via the network **204**. Thus, the packages may be tied to a container **106** after scanning and being placed into a specific slot **210**.
[0035] The transmitter **206** on the container **106** may then be tied to a record with the package identifier scanned by the scanner **202**. This record may be created and stored on the network **204**, cloud, or other remote management system that tracks the chain of custody of the package. The chain of custody of the package may be identified through the record. This information may be transmitted via the transmitter **206** on the container **106**.
[0036] FIG. **3** is a schematic diagram **300** of the container **106** placement on a last mile transporter **302** in accordance with one aspect of the present disclosure. The container **206** may be placed atop the last mile transporter **302**. The transporter **302** may take on the form of an electric mobility device. Pedal assist on the transporter **302** may be provided. A battery may be used which is placed in a central or front portion of the transporter **302** that provides power to an electric motor of the transporter **302**.
[0037] When connected, the transmitter **206** on the container **106** may communicate with the transmitter **304** on the transporter **302**. This may either be through the network **204**, or through direct communications with one another. In one embodiment, when the last mile transporter **302** and the container **106** are connected to one another, an automated link may be established and noted within the record that was created earlier when the package was placed into the container **106**. That is, the record may be updated to reflect that the package is not only in the container **106** but also associated with the transporter **302** on which the container sits atop of. By linking these together, the chain of custody may be updated to reflect on how the package is being delivered to a

destination site, that is, the last mile transporter **302**.
[0038] Both transmitters **206** and **304** may communicate with the network **204** directly to provide record information or may coordinate with one another. For example, the information regarding the container **106** (including the packages contained therein), may be used and provided to the transmitter **304** on the last mile transporter **302**. As an example, the transaction may go from package to container **106** to transporter **302**. The record may indicate that now there is a container **106** and transporter **302**. Location information on the combination may be provided to the management system.
[0039] FIG. **4** is a schematic diagram **400** showing packages **102** from a vehicle **404** placed onto the last mile transporter **302** in accordance with one aspect of the present disclosure. Previously, the chain of custody was related to the container **106** and the transporter **302**. The vehicle **404** may also be part of the chain of custody of the package. Through the vehicle **404**, transporter **302**, and container **106**, a three-tiered structure may be established where records may be kept and packages may be tracked.
[0040] A transmitter **402** may be located on or within the vehicle **404**. The transmitter **402** may be powered by the vehicle's battery or other alternative power source. The transmitter **402** may take the form of a transmission control unit **402**. The transmitter **402**, as will be shown, may be in communication with the network **204** and the transmitter **304** of the transporter **302** and the transmitter **206** of the container. The vehicle **404** may be used to charger the transporter **302** while it is resting within it through a wireline or wireless connection.
[0041] In one embodiment, a scanner may be provided in the vehicle **404** to determine which packages **102** have been picked up and that are outgoing. Object recognition technologies may be used. By recognizing the specific packages **102** that are being placed into the container **106**, the management system may document information about each step of the process.
[0042] Each of the components may communicate with one another including the transmitter **402** on the vehicle **404**, transmitter **304** on the last mile transporter **302**, and the transmitter **206** on the container **106**. They may either communicate directly or through the network **204**. In one example, there might not be a network connection and as such the vehicle **404** might itself be used to keep the chain of custody and management system to track packages.
[0043] In one example of the described system, the package **102** may be picked up as a gig service worker who wants to deliver the package **102** for additional income. The packages **102** in this embodiment may be loaded into the trunk of a vehicle **404** at a centralized distribution center.
[0044] The last mile transporter **302** may be folded into the back of the vehicle **404**. Multiple configurations for collapsing the transporter **302** may be used. Packages **102** may be placed around the transporter **302**. In addition, the containers **106** described earlier may be folded and in a collapsed state. In one embodiment, the containers **106** may be pre-filled and loaded into the back of the vehicle **404** depending on the size of the vehicle.
[0045] The network **204** may connect all three devices together: the vehicle **404**, the last mile transporter **302** and the container **106**. The record of the package being associated with all three may be kept in a record associated with the chain of custody. For example, the record may include the times and dates that the package **102** was within each.
[0046] The transmitters **206**, **304**, and **402** may communicate with one another. In another example, the transmitter **206** in the container **106** may communicate only with the transmitter **304** of the transporter **302** that it has been assigned to or resting atop of. When the container **106** is atop of the transporter **302**, an automated connection or link may be established with one another. The two may then communicate with only one of the transmitters **304** or **206**. The transmitters **402**, **206** and **304** may provide indicators or other information on which device it is associated with. By providing this information, the package may be properly tracked.
[0047] FIG. **5** is a schematic diagram **500** showing transmissions from the vehicle **404**, the container **106**, and the last mile transporter **302** holding the container **106** in accordance with one

aspect of the present disclosure. After packages are loaded into the vehicle, the vehicle **404** may be driven to or near the package's final destination. Information may be provided from the vehicle **404** through the transmitter **402** about its whereabouts when it is driving towards the destination.

[0048] The transporter **302** may be used for the last portion of the trip to deliver the packages. For example, the vehicle **404** may stop at a parking facility and the transporter **302** may be sent for package deliveries for the last few miles. The handler may take the packages from the vehicle **404** and then expand the collapsed transporter **302** from within the vehicle. The folded containers **106** may also be taken out and expanded. The containers **106** may then be placed atop the transporter **302**.

[0049] At each process, the package may be accounted for when it leaves the vehicle **404** and placed into the container **106** atop the last mile transporter **302**. This may occur through the transmitter **402** on the vehicle **404**, the transmitter **304** on the transporter **302**, and the transmitter **206** on the container **106**.

[0050] FIG. **6** is a schematic diagram **600** showing package delivery to its final destination in accordance with one aspect of the present disclosure. After the vehicle **404** arrives at or near the destination, the vehicle **404** may provide that it has stopped through its transmitter **402** to the network **204**. The vehicle **404** may also keep in communication with the last mile transporter **302** or indirectly through the network **204**. This may be performed through the transmitter **304** on the transporter **302**.

[0051] At the destination **602**, the transmitter **206** on the container **106** may be used to open one of the slots **210**. The slots **210***a*, **210***b*, **210***c*, **210***d*, **210***e*, or **210***f* may open automatically. This may be performed automatically after reaching the destination in order to prevent inadvertent package deliveries or misplaced items. A handler **104** would scan the package **102** and then deliver it to the destination **602**. Once this is performed, the record or chain of custody may be completed. Throughout the process, the package **102** whereabouts were maintained by using the three-tiered structure.

[0052] FIG. **7** is a schematic diagram **700** showing package **102** pickups from its origin in accordance with one aspect of the present disclosure. Oppositely, the chain of custody and the record may begin at a user's house **602**. The handler **104** may scan the package **102** through a scanner **202**. This may create a record within a chain of custody.

[0053] The container **106** with its slots **210***a*, **210***b*, **210***c*, **210***d*, **210***e*, and **210***f* may be used to place the package **102** into. A specific slot **210** may be opened automatically when the handler **104** scans the package **102** in. A label may be provided on the package **102** whereby custody may be taken of the package **102**. The label may be printed by the handler **104** and affixed or attached to the package **102**.

[0054] When the slot **210** is opened and closed information may be transmitted directly through the network **204** by the transmitter **206** of the container **106** or indirectly through the transmitter **304** on the transporter **302**. In one embodiment, the network **204** may not be available and either the transmitter **206** on the container **106** or the transmitter **304** on the transporter **302** may directly contact the vehicle **404** through its transmitter **402**. The chain of custody with the container **106**, transporter **302** and the vehicle **404** may thus be established through these connections.

[0055] After the package **102** has been placed into the container **106**, the handler **104** may ride the transporter **302** back to the vehicle **404**. The handler **104** may then at their vehicle load the packages **102** into the vehicle **404** or they may load the entirety of the container **106** into it. The vehicle transmitter **402** may then be used to indicate that it has the package and may be returning the item to the warehouse, shipping center or hub where it may be further packaged. This describes record keeping and the chain of custody for the package **102** with respect to a return of the package **102**.

[0056] Turning to FIG. **8**, a flow chart showing illustrative processes for providing a chain of custody for package delivery in accordance with one aspect of the present disclosure is provided.

Fewer or more processes may be used depending on the scope of the intended uses. The processes may begin at block **800**.

[0057] At block **802**, and when the package is getting delivered to a destination and a chain of custody is to be used, the package may be scanned for a pickup. This may be at the packaging center or hub. Alternatively, this may occur at someone's house or where goods are sold and need to be transported to a destination.

[0058] At block **804**, the package may be placed into the vehicle after scanning. At block **806**, the package may be assigned to the vehicle and the last mile transporter. When the package is placed into the vehicle, a chain of custody and record may be created. The package may be associated with the transporter and the vehicle. A container may be assigned for the package. The container may be preloaded with the package or may be assigned when the package is placed into a container.

[0059] At block **808**, and after arriving at or near the destination where the package is to be dropped off, the package may be deposited in a specific slot within a container atop the last mile transporter. When the package is scanned, a description may be given in which slot to deposit the package into. The package may be confirmed to be placed into the container through a scanner. That is, a scanner may be associated with the container and its specific slots. The slots may be opened automatically to help guide the handler to place the package into.

[0060] At block **810**, the package may be dropped off at the destination. The package delivery may be updated after arriving at the destination. This may include updating the record within the chain of custody for the package that was transported through the container atop the last mile transporter and the vehicle that drove to or near the final destination. The update may include the transmission of the record to a management system to show that the transfer of the package has been completed. This may indicate that the package has been delivered and its whereabouts have been tracked from origin to destination.

[0061] At block **812**, and if applicable, packages at the destination may be picked up. From there another chain of custody may be created after the package is scanned and loaded into the container atop the last mile transporter. This may occur in returned item situations. A tiered structure approach may be used to track the location of the package through the processes described above with the use of the container having a transmitter, the last mile transporter having a transmitter, and the vehicle having a transmitter. The processes may end at block **814**.

[0062] The foregoing description is provided to enable any person skilled in the relevant art to practice the various embodiments described herein. Various modifications to these embodiments will be readily apparent to those skilled in the relevant art and generic principles defined herein may be applied to other embodiments. Thus, the claims are not intended to be limited to the embodiments shown and described herein, but are to be accorded the full scope consistent with the language of the claims, wherein reference to an element in the singular is not intended to mean “one and only one” unless specifically stated, but rather “one or more.” All structural and functional equivalents to the elements of the various embodiments described throughout this disclosure that are known or later come to be known to those of ordinary skill in the relevant art are expressly incorporated herein by reference and intended to be encompassed by the claims. Moreover, nothing disclosed herein is intended to be dedicated to the public regardless of whether such disclosure is explicitly recited in the claims.

Claims

1. A vehicle, comprising: a transmitter; at least one processor; and a memory operatively coupled to the at least one processor, the memory storing program instructions that when executed by the at least one processor, causes the at least one processor to: connect the vehicle with a last mile transporter, wherein the last mile transporter is coupled to a container that includes a plurality of slots, at least one slot of the plurality of slots houses for at least one package, the transmitter

provides information about a chain of custody of the at least one package between the vehicle, the last mile transporter, and the container, and the transmitter further provides information about a time at which the container is coupled to the last mile transporter, and information about times and locations at which the at least one slot is opened and closed; and wherein the time at which the container is coupled to the last mile transporter is automatically recorded by the transmitter upon detecting a physical coupling event between the container and the last mile transporter.

2. The vehicle of claim 1, wherein a scanner is used to enter and remove the at least one package into the chain of custody.

3. The vehicle of claim 1, wherein the at least one processor connects the vehicle with the last mile transporter by associating the last mile transporter with the vehicle when the last mile transporter is inside the vehicle.

4. The vehicle of claim 1, wherein the at least one processor further establishes a connection with the container to form the chain of custody.

5. The vehicle of claim 1, wherein the connection between the vehicle and the last mile transporter is established through the transmitter.

6. The vehicle of claim 1, wherein the chain of custody is established between the vehicle and the last mile transporter and the last mile transporter and the container.

7. The vehicle of claim 1, wherein the last mile transporter comprises a transmitter and the container comprises a transmitter, and the transmitter of the last mile transporter is in communication with the transmitter of the container.

8. The vehicle of claim 7, wherein the transmitter of the last mile transporter communicates with the transmitter of the container over a local area network.

9. The vehicle of claim 1, wherein the at least one package is provided into a designated slot of the plurality of slots within the container.

10. The vehicle of claim 1, wherein the container is collapsible.

11. A system, comprising: a transmitter on a transporter; a transmitter on a container, the container for placement on the transporter, wherein the container includes a plurality of slots, and at least one slot of the plurality of slots houses at least one package; and a management system in communication with the transmitter on the transporter and the transmitter on the container for creating a record of ownership for the at least one package placed within the container from an origin to a destination, wherein the record provides information about a time at which the container is coupled to the transporter, and information about times and locations at which the at least one slot is opened and closed; wherein the time at which the container is coupled to the transporter is automatically recorded in response to a detected physical coupling event.

12. The system of claim 11, wherein the management system is located on a vehicle.

13. The system of claim 12, wherein the vehicle establishes a local area network to communicate with the transmitter on the transporter and the transmitter on the container.

14. The system of claim 12, wherein a three-tiered structure is created for the record of ownership.

15. The system of claim 12, wherein the transporter is collapsible into a trunk of the vehicle.

16. A method for managing a location of a package, the method comprising: receiving an identifier of the package; associating a container for which the package has been inserted into with a record, wherein the container includes a plurality of slots, and at least one slot of the plurality of slots houses the package; associating a last mile transporter for which the container has been placed onto with the record; transmitting the record for managing the location of the package, wherein the record provides information about a time at which the container is coupled to the last mile transporter, and information about times and locations at which the at least one slot is opened and closed; and wherein the time at which the container is coupled to the last mile transporter is automatically recorded in response to a physical coupling detection.

17. The method of claim 16, comprising associating a vehicle for which the last mile transporter is placed into with the record before transmitting the record for managing the location of the package.

18. The method of claim 16, wherein the record represents a chain of custody.
19. The method of claim 16, wherein the last mile transporter is collapsible.
20. The method of claim 16, further comprising closing the record when the location of the package has reached a destination.