Anti theft device for a mobile carrier

FIELD OF INVENTION

[01] This application relates to an anti theft system for mobile carrier. More particularly, the present invention pertains to anti theft systems that can be selectively activated to deter removal of the mobile carrier or shopping cart from a predetermined area like supermarkets or other retail establishments.

BACKGROUND OF THE INVENTION

[02] Supermarket shopping becomes an essential consumer behavior of the modern society. Supermarket shopping carts, as convenient means of delivery, play an important role. Shopping carts, sometimes referred to as shopping trolleys, are well known and are provided by supermarkets or other retail establishments for shoppers to transport goods to be purchased in a very convenient manner. However, supermarkets are known to have a problem in that from time to time shopping carts may be removed from the premises by unauthorized personnel. In urban areas, where users may work or reside within walking distance from the retailer, the vehicle may be “borrowed” for the purpose of assisting the user in carrying purchased merchandise to their destination. Such removal costs retail businesses money to either replace or locate the trolleys and return them to a desired location.

[03] Many methodologies and apparatus have been suggested in the past for avoiding the unauthorized removal of shopping carts. Patent number US7740114B2 in Fig 1 shows a braking shell 102 mechanisms installed onto the wheels of the shopping carts. Upon activation, the braking shell 102 is lowered, contacting the ground between the wheel and the ground, thereby preventing

rotation of the wheel. One problem with this arrangement is that the portion which contacts the ground becomes worn over time and eventually needs to be replaced. This replacement is usually difficult, making the cost and time required for maintenance relatively high.

[04] Patent number US20100252371 shown in Fig 2 is another braking mechanism to prevent unauthorized removal of shopping cart. Upon activation, a braking pad 202 is push into a locking position between the wheel and the ground, thereby preventing the rotation of the wheel. Similar to US7740114B2, the maintenance cost for this method is relatively high.

[05] Patent number US20080074260 in Fig 3 used a locking mechanism to lock the wheels in a specific angle when the shopping cart moved beyond a predetermined area. This method of preventing shopping cart theft is only workable when the user encounter a turning path and turn the shopping cart. The act of turning the shopping cart will cause a locking pin 302 in the front wheel to move into a notch 304 of a collar member and lock the shopping cart to a specific angle. To overcome this locking problem, user can simply stop at the turning path, lift the front of the shopping cart and navigate it around the turning path. As long as the front wheel do not turn and lock, the user can continue with his straight path ahead with no problem. Patent number US8632081 in Fig 4 shows another method to prevent shopping cart theft that is similar to Patent number US20080074260.

[06] In Singapore, a common method to prevent shopping cart theft is shown in Fig 5 to Fig 10. Referring to Fig 5, a user proceeds to a shopping cart collection or return point 502 to collect a shopping cart 504. At the collection point 502, the shopping cart 504 is locked by a locking male connector 606 that is inserted into a locking female inlet 608 on a locking box 604 secured to a shopping cart

handle 602, this is shown in Fig 6. The locking male connector 606 is attached to the locking box 604 of another shopping cart using a locking chain 610. To unlock the shopping cart 504, the user insert a one dollar coin 702 into a coin insertion slot 704 shown in Fig 7. In Fig 8 and Fig 9, when the one dollar coin 702 is pushed into the coin insertion slot 704, the locking male connector 606 will be ejected out from the locking female inlet 608. The user removes the shopping cart 504 in Fig 10 and proceeds to use it for his shopping activities. When the user complete his shopping activities, he will return the shopping cart 504 to the same or another shopping cart collection or return point 502 and insert the locking male connector 606 of another shopping cart into the locking female inlet 608. This will extract the one dollar coin 702 from the coin insertion slot 704 and return to the user.

[07] The above (paragraph 6) method to prevent shopping cart theft is not ideal because it can be easily circumvented. User with ill intent can simply push the shopping cart 504 to a remote location with no video recorder or witness and use a screw driver or some simple tools to extract the one dollar coin 702.

[08] It is the objective of this patent to provide a more secure and cost efficient method to prevent theft of shopping cart without incurring high installation and maintenance cost to shopping cart owners or retailers.

SUMMARY OF THE INVENTION

[09] In accordance with one embodiment, a manual combination padlock is secured within a padlock container that is attached to a shopping cart. To prevent unauthorized removal of the shopping cart, a set of chains are used to secure the shopping cart to the manual combination lock. When the user needs to use the shopping cart, he will have to use his smartphone to access a shopping cart

system. The user login with his registered account name and password on his smartphone and scan a QR code displayed on the padlock container. Upon success, the user will be notified of a code that is needed to unlock the manual combination padlock. The user unlocks the shopping cart and proceeds to use it for his shopping process. When the user completed his shopping, he will push the shopping cart to a return location, login to the shopping cart system, lock up the shopping cart using the set of chains with the manual combination padlock, and scan another unique QR code at return location to complete the return process.

BRIEF DESCRIPTION OF THE DRAWING

[10] In the drawings, closely related figures have the same number but different alphabetic suffixes.

FIG. 1 shows a braking shell mechanism in patent number US7740114B2.

FIG. 2 shows a braking pad mechanism in patent number US20100252371.

FIG. 3 shows an angle locking mechanism in patent number US20080074260.

FIG. 4 shows an angle locking mechanism in patent number US8632081.

FIG. 5 shows a prior art shopping cart collection and return point.

FIG. 6 shows a prior art shopping cart locking mechanism.

FIG. 7 shows a prior art shopping cart being unlocked using a one dollar coin.

FIG. 8 shows a prior art shopping cart being unlocked.

FIG. 9 shows a prior art shopping cart being unlocked.

FIG. 10 shows a prior art shopping cart being removed for usage.

FIG. 11 shows a shopping cart collection and return point.

FIG. 12 shows a shopping cart locking mechanism.

FIG. 13 shows a close up view of a shopping cart locking mechanism.

FIG. 14 shows a smartphone with a shopping cart application icon.

FIG. 15 shows a login screen of a shopping cart system.

FIG. 16 shows a back view of a smartphone.

FIG. 17 shows a main menu screen of a shopping cart system.

FIG. 18 shows a smartphone capturing a QR code and communicating with a shopping cart system server computer.

FIG. 19 shows a smartphone with an unlock code.

FIG. 20 shows a user removing a shopping cart.

FIG. 21 shows a shopping cart being returned after usage.

FIG. 22 shows a shopping cart being locked.

FIG. 23 shows a smartphone being used to complete a shopping cart return process.

FIG. 24 shows a smartphone captures an image of a QR code and a rotary discs pattern.

FIG. 25 shows a smartphone captures an image of a QR code at a return point.

FIG. 26 shows a padlock container being opened.

FIG. 27 shows four padlock containers being opened.

FIG. 28 shows two padlocks being removed for interchange.

FIG. 29 shows two padlocks interchange and place into two padlock containers.

FIG. 30 shows a smartphone with a staff shopping cart application.

FIG. 31 shows a login screen for a staff shopping cart system.

FIG. 32 shows a menu for a staff shopping cart system.

FIG. 33 shows a smartphone capturing an image of a QR code and number pattern on a padlock.

FIG. 34 shows a smartphone with a registration confirmation note.

FIG. 35 shows another embodiment of an anti theft device.

FIG. 36 shows a smartphone capturing an image of a QR code.

FIG. 37 shows a smartphone communicating with a server to wirelessly unlock a electronic padlock.

FIG. 38 shows a padlock container being opened and a electronic padlock removed.

FIG. 39 shows a electronic padlock being interchanged on a padlock container.

FIG. 40 shows another embodiment of an anti theft device.

FIG. 41 shows a smartphone capturing an image of a QR code on an electronic lock box.

FIG. 42 shows a smartphone communicating with a server to unlock an electronic lock box.

FIG 42A shows another embodiment of an anti theft device.

FIG 42B shows another perspective of an anti theft device.

FIG. 43 shows another application of an anti theft device in hospital.

FIG. 44 shows a set of wheel chairs in a locked position.

FIG. 45 shows a smartphone displaying a menu of a wheel chair system.

FIG. 46 shows another application of an anti theft device for the renting and sharing of a personal mobility device.

FIG. 47 shows a personal mobility device in locked position.

FIG. 48 shows a flowchart of the borrowing process.

FIG. 49 shows a flowchart of the returning process.

DRAWINGS - Reference Numerals

102	Braking shell
202	Braking pad
302	Locking pin
304	Notch
502	Shopping cart collection or return point

504	Shopping cart
602	Shopping cart handle
604	Locking box
606	Locking male connector
608	Locking female inlet
610	Locking chains
702	One dollar coin
704	Coin insertion slot
1102	Shopping cart collection or return point
1104	Mobile carrier or shopping cart
1106	User
1108	Image or video recorder
1110	Return point second pattern or QR code
1112	Locking structure or stationary stand
1202	Padlock container
1204	Set of chains
1206	Manual combination padlock
1208	Mobile carrier structure or shopping cart handle
1302	First pattern or Quick Response or QR code
1304	Set of rotary discs
1402	Smartphone
1404	Shopping cart application or system
1502	Shopping cart system title
1504	User login identification name textbox
1506	User password textbox
1508	Instruction text

1510	Login button
1512	Forgot password button
1514	Register a new account button
1602	Finger print scanner
1604	Smartphone rear camera
1702	Borrow cart button
1704	Return cart button
1706	Report damage button
1708	Check history button
1710	Settings button
1802	Camera box
1804	Instruction to scan QR code
1806	Shopping cart system server computer
1808	Wireless antenna
1810	Internet connection
1902	Unlock code
2402	Camera box
2404	Instruction note
2502	Instruction note
2504	Camera box
2506	QR code frame
2508	QR code location label
2602	Key
2604	Locking latch
2606	Locking catch
2608	First manual combination padlock

2610 First padlock container

2612 First shopping cart

2704 Second shopping cart

2706 Third shopping cart

2708 Forth shopping cart

2712 Second padlock container

2714 Third padlock container

2716 Forth padlock container

2720 Second manual combination padlock

2722 Third manual combination padlock

2724 Forth manual combination padlock

2902 First Quick Response or QR code

2904 Second Quick Response or QR code

3002 Smartphone

3004 Staff shopping cart application

3102 Login user identification textbox

3104 Password textbox

3106 Login now button

3108 Staff shopping cart application title

3202 Register new code button

3204 Report damage button

3206 Settings button

3302 Camera box

3304 Instruction note

3402 Registration confirmation note

3502 First electronic padlock

3504	Second electronic padlock
3602	Shopping cart system version two title
3604	Instruction note
3606	Camera box
3608	Bar code
3702	Unlock status information
3802	Button battery
3804	Battery insert slot
3902	Camera box
4002	First electronic lock box
4004	Second electronic lock box
4006	First Quick Response or QR code
4008	Second Quick Response or QR code
4010	First male connector
4102	Shopping cart system version three title
4104	Instruction note
4106	Camera box
4204	Unlock status message
4206	Female connector inlet
4220	Manual combination lock box
4222	Quick Response or QR code
4224	Set of rotary discs
4226	Male connector with chain
4228	Shopping cart
4302	Wheel chair collection and return point
4304	Image or video recorder

4306 Quick Response or QR code

4308 Mobile carrier or wheel chair

4310 User

4402 Chain

4404 Padlock container

4406 Manual combination padlock

4502 Quick Response or QR code

4504 Wheel chair system title

4506 Borrow wheel chair button

4508 Return wheel chair button

4510 Rent wheel chair button

4512 Buy wheel chair button

4602 User

4604 Personal mobility device collection and return point

4608 Image or video recorder

4610 Quick Response or QR code

4612 Mobile carrier or personal mobility device or PMD

4614 Locking stand

4702 Padlock container

4704 Quick Response or QR code

4706 Manual combination lock

4708 Chain

4802 User approaches mobile carrier collection point

4804 Login to mobile carrier application with electronic device

4806 Login success check

4808 Login not successful

4810 Login successful

4812 Activate borrowing function

4814 Capture image or images of first pattern or QR code

4816 Send data of first pattern to server computer

4818 Server computer verify data of first pattern

4820 Verify success check on data of first pattern

4822 Verify not successful

4824 Verify successful

4826 Server computer retrieve unlock code

4828 Server computer transmit unlock code to electronic device

4830 Unlock anti theft device

4832 User removes mobile carrier for use

4902 User pushes mobile carrier to return point

4904 Login to mobile carrier application with electronic device

4906 Login success check

4908 Login not successful

4910 Login successful

4912 Activate returning function

4914 Capture image or images of first pattern or QR code

4918 Send data of first pattern to server computer

4920 Server computer verify data of first pattern

4922 Verify success check on data of first pattern

4924 Verify not successful

4926 Verify successful

4928 Secure and lock mobile carrier with anti theft device

4930 Lock success check

4932 Lock not successful

4934 Lock successful

4936 Capture image or images of second pattern or QR code

4938 Send data of second pattern to server computer

4940 Server computer verify data of second pattern

4942 Verify success check on data of second pattern

4944 Verify not successful

4946 Verify successful

4948 Mobile carrier return completion

DETAILED DESCRIPTION OF THE INVENTION

[11] One embodiment of an anti theft device is illustrated in Fig 11. A user 1106 wants to borrow a mobile carrier or shopping cart 1104 to do his weekly groceries shopping. The user 1106 approaches a shopping cart collection or return point 1102. This action by the user 1106 is captured by an image or video recorder 1108. A return point second pattern or QR code 1110 is placed near the collection or return point 1102. The purpose of the QR code 1110 will be explained in later part of this description.

[12] Shown in Fig 12, the shopping cart 1104 is locked from removal using a locking device and a binding device. The locking device and the binding device is made up of a set of chains 1204 that is attached to a manual combination padlock 1206 in a padlock container 1202. The padlock container 1202 is secured to a mobile carrier structure or shopping cart handle 1208 or a locking structure or stationary stand 1112. The chains 1204 from an adjacent shopping cart is secured to a manual combination padlock 1206 to prevent unauthorized removal. Fig 13 shows a clearer view of the padlock container 1202. Every unit of the padlock

container 1202 is attached with a unique first pattern or Quick Response or QR code 1302. A set of rotary discs 1304 are preset to an initial value of "0000".

[13] Referring to Fig 14, the user 1106 takes out an electronic device or a smartphone 1402 and launches a shopping cart application or system 1404. Fig 15 shows the smartphone 1402 with a shopping cart system title 1502. A register a new account button 1514 allows the user 1106 to create an account in the system before any borrowing process can occur. In the event that the user 1106 forgot his password, he can tap on a forgot password button 1512. A new password will be send to the user's 1106 smartphone by SMS (Short Message Service) system or email. An instruction text 1508 is displayed prompting the user 1106 to enter his ID or identification name and password, alternatively he can scan his finger print on a finger print scanner 1602 (shown in Fig 16) at the back of the smartphone 1402. The user 1106 inputs his user identification name into a user login identification name textbox 1504, enters his password in user password textbox 1506, and taps on a login now button 1510.

[14] Fig 17 shows a main menu screen interface where the user 1106 can interact with the shopping cart system 1404. It consists of a borrow cart button 1702, a return cart button 1704, a report damage button 1706, a check history button 1708 and a settings button 1710. The borrow cart button 1702 is used when the user 1106 want to borrow the shopping cart 1104 for his groceries purchase, this will be explain in later section. The return cart button is used after the user 1106 has completed his groceries purchase and wanted to end his shopping cart borrowing process. The report damage button 1706 allows the user 1106 to report any damages found on the shopping cart 1104. The check history button 1708 allows the user 1106 to look at the history of his previous transactions. The settings button 1710 is meant for the user 1106 to update his personal profile,

change password and etc.

[15] To proceed with the shopping cart 1104 borrowing process, the user 1106 tap on the borrow cart button 1702. The smartphone 1402 switches to image or video capturing mode shown in Fig 18 with an instruction to scan QR code 1804. The user 1106 directs a smartphone rear camera 1604 (Shown in Fig 16) at the QR code 1302 and makes sure that the image fit within a camera box 1802. The smartphone1402 captures the image of the QR code 1302 and generates a first digital data packet or packets based on the image of the QR code 1302. The first digital data packet or packets is transmitted to a shopping cart system server computer 1806 through a wireless technology (Example 4G, 5G) to a wireless antenna 1808 that is connected to the server computer 1806 through an internet connection 1810. The shopping cart system server computer 1806 acknowledges the request, retrieves an unlock code 1902 and send the unlock code 1902 to the smartphone 1402 as shown in Fig 19. Using the unlock code 1902, the user 1106 rotates the set of rotary discs 1304 to correct combination, unlocks the padlock 1206 and detaches the set of chains 1204. The shopping cart 1104 can now be removed by the user 1106 to begin his groceries shopping process as shown in Fig 20.

[16] In Fig 21, the user 1106 completes his groceries shopping and pushes the shopping cart 1104 to the collection or return point 1102 (Fig 20). The user 1106 put the set of chains 1204 into the padlock 1206 and reset the set of rotary discs 1304 to the initial "0000" position shown in Fig 21 and Fig 22. The user 1106 takes out the smartphone 1402 and taps on the return cart button 1704 as shown in Fig 23. The smartphone 1402 switches to image and video capturing mode in Fig 24. An instruction note 2404 instructs the user 1106 to scan the QR code 1302 together with the set of rotary discs 1304. If the number pattern (refer to as

a third pattern) on the set of rotary discs 1304 is not reset to its initial position of "0000", the shopping cart application 1404 will give an error and will not proceed to next step until the correct reset procedure is done. The QR code 1302 and number pattern on the set of rotary discs 1304 is captured within a camera box 2402 and transmits to the server computer 1806 using wireless communication technology. The server computer 1806 verifies and instructs the user 1106 to scan the return point QR code 1110 with an instruction note 2502 in Fig 25. The user 1106 directs the smartphone 1402 so an image of the return point QR code 1110 is placed within a camera box 2504. The server computer 1806 verifies the QR code 1110 is correct and completes the shopping cart returning process. To prevent users from circumventing the system, the return point QR code 1110 at a QR code location label 2508 will be changed at random time during operation. This is done by removing the return point QR code 1110 from a QR code frame 2506. It is to be noted that the entire shopping cart borrowing and returning process is capture by the image or video recorder 1108 in Fig 20. If and user attempts to illegally unlock the shopping cart 1104 immediately after completing the returning process, the use of the shopping cart borrowing and returning time stamp and recording on the image or video recorder 1108 can be used to easily track the illegal activities.

[17] In order to further enhance the robustness of the system, the system may make it mandatory for the user 1106 to turn on a GPS (Global Positioning System) function on the smartphone 1402. By doing this, the GPS data will be captured by the system to verify the return location of the shopping cart 1104.

[18] The process of borrowing and returning of the mobile carrier or shopping cart 1104 shown from Fig 11 to Fig 25 was done using the smartphone 1402 that belongs to the user 1106. It is possible that the returning process of the shopping

cart 1104 may be completed using another user's smartphone. For example, a first user approaches the shopping cart collection or return point 1102, activates the shopping cart application or system 1404, and borrows the shopping cart 1104 using his personal smartphone (Similar to Fig 11 to Fig Fig 20). The first user completes his groceries shopping and pushes the shopping cart 1104 to his motor vehicle in the car park. While the first user transfers his groceries into his motor vehicle, a second user may proceed to push the shopping cart 1104 to the return point 1102. The second user takes out her personal smartphone, login to the shopping cart application or system 1104 and completes the return process (Similar to Fig 21 to Fig 25).

[19] In order to increase the security level of the anti theft device, a padlock interchange process is performed by a staff (Not shown in the drawings) overseeing the management and maintenance of the entire fleet of shopping carts. This process is performed on a periodical time (Example, daily, weekly, monthly and etc.). In Fig 26, a first padlock container 2610 is opened using a key 2602. The locking and unlocking mechanism works by mean of a locking latch 2604 and a locking catch 2606. A first manual combination padlock 2608 is removed from the first padlock container 2610 that is attached to a first shopping cart 2612. This same action is performed on a second shopping cart 2704, a second padlock container 2712, a second manual combination padlock 2720, a third shopping cart 2706, a third padlock container 2714, a third manual combination padlock 2722, a forth shopping cart 2708, a forth padlock container 2716 and a forth manual combination padlock 2724. In Fig 28, the first manual combination padlock 2608 and the second manual combination padlock 2720 are removed from the first padlock container 2610 and the second padlock container 2712 respectively. The second manual combination padlock 2720 is

interchanged and placed inside the first padlock container 2610 while the first manual combination padlock 2608 is placed inside the second padlock container 2712. This action is performed for the remaining shopping cart. A first Quick Response or QR code 2902 and a second Quick Response or QR code 2904 shown in Fig 29 will be used in later stage of the interchange process.

[20] The staff takes out a smartphone 3002 and tap on a staff shopping cart application 3004 shown in Fig 30. The application 3004 executes and displays a login screen with a staff shopping cart application title 3108 shown in Fig 31. The staff enter his login name into a login user identification textbox 3102, input his password into a password textbox 3104 and tap on a login now button 3106. In Fig 32, the smartphone 3002 displays three buttons, a register new code button 3202, a report damage button 3204 and a settings button 3206. The staff taps on the register new code button 3202 to launch an image acquisition operation. Referring to Fig 33, an instruction note 3304 instructs the staff to scan the QR code and the number pattern on the combination padlock 2720 (Refer to as the third pattern in this patent). The staff positions the smartphone 3002 over the first Quick Response or QR code 2902 and the second manual combination padlock 2720. An image of the QR code 2902 and padlock 2720 is captured inside a camera box 3302 and send to the shopping cart system server computer 1806 (Fig 18). The server computer 1806 updates the new setting into its database and transmits a registration confirmation note 3402 to the smartphone 3002 as shown in Fig 34. This registration operation is repeated for the second Quick Response or QR code 2904 and first manual combination padlock 2608. This operation is repeated over the entire fleet of shopping carts.

[21] Referring to Fig 35, another embodiment of the anti theft device is shown. The main difference is the replacement of the first manual combination padlock 2608

and second manual combination padlock 2720 with a first electronic padlock 3502 and a second electronic padlock 3504. To unlock the first shopping cart 2612, the user 1106 launches a smartphone application with a shopping cart system version two title 3602 as shown in Fig 36. Based on an instruction note 3604 that instruct the user 1106 to scan the QR code 2902, the user 1106 positions the smartphone 1402 so that the QR code 2902 is captured inside a camera box 3606. The first electronic padlock 3502 is identified using a bar code 3608. In Fig 37, the smartphone 1402 transmits a digital data packet of the QR code 2902 to the shopping cart system server computer 1806 through the wireless antenna 1808 and the internet connection 1810. The server computer 1806 responds with a digital data packet necessary for the smartphone 1402 to wirelessly unlock the first electronic padlock 3502. A unlock status information 3702 informs the user 1106 the status of the transmission process described above. To further enhance the security of the anti theft device, the first padlock container 2610 may be opened. In Fig 38, a button battery 3802 is inserted into a battery insert slot 3804.The staff interchanges the first electronic padlock 3502 with the second electronic padlock 3504 and activate the smartphone application 3004. An image of the QR code 2902 and bar code 3608 is placed inside a camera box 3902 so that the new setting is updated to the shopping cart system server computer 1806. This is shown in Fig 39.

[22] Fig 40 shows another embodiment of the anti theft device. The first shopping cart 2612 is connected and locked with the second shopping cart 2704 using a first male connector 4010, a first electronic lock box 4002 and a second electronic lock box 4004. A first Quick Response or QR code 4006 and a second Quick Response or QR code 4008 is attached to the first electronic lock box 4002 and the second electronic lock box 4004 respectively. To unlock the first shopping

cart 2612, the user 1106 launch a smartphone application on the smartphone 1402 with a shopping cart system version three title 4102 shown in Fig 41. An instruction note 4104 instructs the user 1106 to scan an image of the QR code 4006 within a camera box 4106. In Fig 42, the smartphone 1402 transmits a set of data packets based on the image of the QR code 4006 to the shopping cart system server computer 1806. This is done through wireless communication (Example, 3G or 4G network, wifi and etc.) to the wireless antenna 1808 and the internet connection 1810. Once the authentication completes, the server computer 1806 transmits a digital unlock code to the smartphone 1402. The smartphone 1402 uses the digital unlock code to transmit wireless data or signal to the first electronic lock box 4002. Upon receiving the digital unlock code, the first electronic lock box 4002 ejects the first male connector 4010 from a female connector inlet 4206. This unlock operation completes with a unlock status message 4204 on the smartphone 1402.

[23] Fig 42A and Fig 42B shows another embodiment of the anti theft device. A shopping cart 4228 is secured using a manual combination lock box 4220, a Quick Response or QR code 4222 and a binding device or male connector with chain 4226. A set of rotary discs 4224 is used to unlock and release the male connector with chain 4226 from the manual combination lock box 4220. The unlocking and returning procedure for this application is similar to Fig 11 to Fig 25.

[24] Fig 43 shows another application of the anti theft device within a hospital premises. On many occasion, a user 4310 will find it necessary to use a wheel chair in a hospital for obvious reasons. The user 4310 approaches a mobile carrier or wheel chair 4308 at a wheel chair collection and return point 4302 which is monitored using an image or video recorder 4304. A Quick Response or

QR code 4306 is found at the return point 4302 that is used as final confirmation during the return of the wheel chair 4308. As shown in Fig 44, the wheel chair 4308 is secured using a chain 4402, a manual combination padlock 4406 and a padlock container 4404. Referring to Fig 45, a Quick Response or QR code 4502 is attached to the padlock container 4404 that is used for the unlocking of the wheel chair 4308. To unlock the wheel chair 4308, the user 4310 launches a smartphone application with a wheel chair system title 4504. Using a borrow wheel chair button 4506 and a return wheel chair button 4508, the complete operation of borrowing and returning is similar to Fig 14 to Fig 25. If the user 4310 needs to use the wheel chair 4308 from hospital to home, he may consider tapping on a rent wheel chair button 4510 to rent it for a few days at a cost. Alternatively, the user 4310 may consider tapping on a buy wheel chair button 4512 to buy the wheel chair 4308.

[25] Fig 46 shows another application of the anti theft device for the renting and sharing of a mobile carrier or personal mobility device or PMD 4612. A user 4602 approaches a PMD 4612 at a personal mobility device collection and return point 4604 which is monitored using an image or video recorder 4608. A Quick Response or QR code 4610 is found at the return point 4604 that is used as final confirmation during the return of the PMD 4612. As shown in Fig 47, the PMD 4612 is secured using a chain 4708, a manual combination padlock 4706, a padlock container 4702 and a locking stand 4614. A Quick Response or QR code 4704 is attached to the padlock container 4702 that is used for the unlocking of the PMD 4612. The unlocking and returning procedure for this application is similar to Fig 11 to Fig 25.

[26] Fig 48 shows a flowchart of the borrowing process of the anti theft device for the mobile carrier.

[27] Fig 49 shows a flowchart of the returning process of the anti theft device for the mobile carrier.

[28] The advantages of the anti theft device for the mobile carrier are as followed:

1. There is no need to perform modification or alteration to the wheel. Installation of the anti theft device is simply the attachment of the padlock container 1202 to the shopping cart 1104 or any mobile carriers.
2. There is little or virtually no replacement needed due to wears and tears in the anti theft device. This is not the case in the prior art shown in Fig 1 and Fig 2.
3. Cost of implementing the anti theft device can be maintained at very low level. This is shown in Fig 11 to Fig 25 where all the parts of the invention are mechanical except for the smartphone, the digital network structure and the computer server. Most of the digital network infrastructures are already in place for most of the retail stores in many countries.
4. Usage of the shopping cart can be track by the management team of the shopping cart system. Loyalty rewards, discounts and incentive events can be easily implemented through the system to cultivate customer loyalties. The management team can also make use of usage data to improve operation.

CLAIMS

What is claimed is:

1. An anti theft device for a mobile carrier, comprising:

   a. a locking device

   b. a binding device

   c. a locking structure

   d. an electronic device

   e. a server computer

   f. a first pattern

   whereby

   said first pattern is secured to said locking device,

   said locking device is secured to said mobile carrier,

   said locking device is secured to said binding device,

   said binding device is secured to said locking structure,

   said electronic device captures at least one image of said first pattern,

   said electronic device generates a first digital data packet or packets based on said image or images of said first pattern,

   said electronic device transmits said first digital data packet or packets to said server computer,

   said server computer retrieves an unlock code based on said first digital data packet or packets,

   said server computer transmit said unlock code to said electronic device,

   said unlock code is used to unlock said locking device that is secured to said mobile carrier,

said binding device is detached from said locking device,

said mobile carrier is released from said anti theft device for use.

2. The anti theft device of claim 1 wherein said electronic device is selected from the group consisting of mobile device, smartphone, image scanner, tablet computer, desktop computer, and laptop.

3. The anti theft device of claim 1 wherein said first pattern is selected from the group consisting of quick response code, bar code, and data matrix.

4. The anti theft device of claim 1 wherein said binding device is selected from the group consisting of chains, rope, wire, and series of connected structure.

5. The anti theft device of claim 1 wherein said locking device is selected from the group consisting of electronic lock box and manual combination lock box.

6. The anti theft device of claim 1 wherein said locking device is comprises of a padlock container and a padlock, said padlock is selected from the group consisting of manual combination padlock and electronic padlock.

7. The anti theft device of claim 1 wherein said locking structure is selected from the group consisting of stationary stand and mobile carrier structure.

8. The anti theft device of claim 1, further including a visual recording device, said visual recording device is selected from the group consisting of image recorder and video recorder.

9. An anti theft device for a mobile carrier, comprising:

a. a locking device

b. a binding device

c. a locking structure

d. an electronic device

e. a server computer

f. a first pattern

g. a second pattern

whereby

said first pattern is secured to said locking device,

said locking device is secured to said mobile carrier,

said binding device is secured to said locking structure,

said binding device attaches to said locking device,

said electronic device captures at least one image of said first pattern,

said electronic device generates a first digital data packet or packets based on said image or images of said first pattern,

said electronic device transmits said first digital data packet or packets to said server computer,

said electronic device captures at least one image of said second pattern that is secured to a return location for said mobile carrier,

said electronic device generates a second digital data packet or packets based on said image or images of said second pattern,

said electronic device transmits said second digital data packet or packets to said

server computer,

said server computer authenticates said first digital data packet or packets and said second digital data packet or packets,

said server computer transmits an acknowledgement data packet or packets to said electronic device.

10. The anti theft device of claim 9 wherein said electronic device is selected from the group consisting of mobile device, smartphone, image scanner, tablet computer, desktop computer, and laptop.

11. The anti theft device of claim 9 wherein said first pattern and said second pattern are selected from the group consisting of quick response code, bar code, and data matrix.

12. The anti theft device of claim 9 wherein said second pattern is changed after a predetermine time duration or a random time duration has lapsed.

13. The anti theft device of claim 9 wherein said binding device is selected from the group consisting of chains, rope, wire, and series of connected structure.

14. The anti theft device of claim 9 wherein said locking device is selected from the group consisting of electronic lock box and manual combination lock box.

15. The anti theft device of claim 9 wherein said locking device is comprises of a padlock container and a padlock, said padlock is selected from the group consisting of manual combination padlock and electronic padlock.

16. The anti theft device of claim 9 wherein said locking structure is selected from the group consisting of stationary stand and mobile carrier structure.

17. The anti theft device of claim 9, further including a visual recording device, said visual recording device is selected from the group consisting of image recorder and video recorder.

18. The anti theft device of claim 9, further including a third pattern, said electronic device captures at least one image of said third pattern, said electronic device generates a third digital data packet or packets based on said image or images of said third pattern, said electronic device transmits said third digital data packet or packets to said server computer for authentication.

19. A method of anti theft prevention for a mobile carrier, comprising:

a. providing a first pattern that is secured to a locking device,

b. securing said locking device to said mobile carrier,

c. providing a binding device that is secured to a locking structure,

d. attaching said binding device to said locking device,

e. capturing at least one image of a first pattern,

f. generating a first digital data packet or packets based on said image or images of said first pattern,

g. transmitting said first digital data packet or packets to a server computer,

h. retrieving an unlock code based on said first digital data packet or packets

to said server computer,

i. transmitting said unlock code from said server computer to an electronic device,

j. unlocking said locking device using said unlock code,

k. detaching said binding device from said locking device,

l. releasing said mobile carrier from said anti theft device for use.

20. The anti theft device of claim 19 wherein said electronic device is selected from the group consisting of mobile device, smartphone, image scanner, tablet computer, desktop computer, and laptop.

21. The anti theft device of claim 19 wherein said first pattern is selected from the group consisting of quick response code, bar code, and data matrix.

22. The anti theft device of claim 19 wherein said binding device is selected from the group consisting of chains, rope, wire, and series of connected structure.

23. The anti theft device of claim 19 wherein said locking device is selected from the group consisting of electronic lock box and manual combination lock box.

24. The anti theft device of claim 19 wherein said locking device is comprises of a padlock container and a padlock, said padlock is selected from the group consisting of manual combination padlock and electronic padlock.

25. The anti theft device of claim 19 wherein said locking structure is selected from the group consisting of stationary stand and mobile carrier structure.

26. The anti theft device of claim 19, further including a visual recording device, said visual recording device is selected from the group consisting of image recorder and video recorder.

27. A method of anti theft prevention for a mobile carrier, comprising:

a. providing a first pattern that is secured to a locking device,

b. securing said locking device to said mobile carrier,

c. providing a binding device that is secured to a locking structure,

d. attaching said binding device to said locking device,

e. capturing at least one image of said first pattern using an electronic device,

f. generating a first digital data packet or packets based on said image or images of said first pattern,

g. transmitting said first digital data packet or packets to a server computer,

h. providing a second pattern that is secured to a return location for said mobile carrier,

i. capturing at least one image of the second pattern using said electronic device,

j. generating a second digital data packet or packets based on said image or images of said second pattern,

k. transmitting said second digital data packet or packets to a server computer,

l. authenticating said first digital data packet or packets and said second digital data packets or packets,

m. transmitting an acknowledgement data packet or packets to said electronic device.

28. The anti theft device of claim 27 wherein said electronic device is selected from the group consisting of mobile device, smartphone, image scanner, tablet computer, desktop computer, and laptop.

29. The anti theft device of claim 27 wherein said first pattern and said second pattern are selected from the group consisting of quick response code, bar code, and data matrix.

30. The anti theft device of claim 27 wherein said binding device is selected from the group consisting of chains, rope, wire, and series of connected structure.

31. The anti theft device of claim 27 wherein said second pattern is changed after a predetermine time duration or a random time duration has lapsed.

32. The anti theft device of claim 27 wherein said locking device is selected from the group consisting of electronic lock box and manual combination lock box.

33. The anti theft device of claim 27 wherein said locking device is comprises of a padlock container and a padlock, said padlock is selected from the group consisting of manual combination padlock and electronic padlock.

34. The anti theft device of claim 27 wherein said locking structure is selected from the group consisting of stationary stand and mobile carrier structure.

35. The anti theft device of claim 27, further include capturing an usage activities of said mobile carrier using a visual recording device, said visual recording device is selected from the group consisting of image recorder and video recorder.

36. The anti theft device of claim 27, furthering include providing a third pattern, capturing at least one image of said third pattern using said electronic device, generating a third digital data packet or packets based on said image or images of said third pattern, transmitting said third digital data packet or packets to said server computer, authenticating said third digital data packet or packets in said server computer.