A STORAGE CONTAINER AND SYSTEM THEREOF

FIELD OF INVENTION

The invention relates to a storage container. More particularly, the invention relates to a storage container incorporated with sensor units for inventory checking and the storage container is linkable to a system for inventory management.

BACKGROUND OF THE INVENTION

Police's equipment including handguns, batons, handcuffs and ammunition are stored in a secured cabinet. Such cabinet is usually integrated with access control and management system for authentication and accountability purpose. Nevertheless, there are still reports of missing equipment from the cabinet which can cause potential threat to the safety and security of the citizen when the missing equipment falls into the wrong hands. The main reasons of the missing equipment problem is that the current management system often lacks of the capability of inventory checking. Furthermore, the cabinet does not have see-through walls which allow a person to inspect manually on the equipment that is stored within the cabinet. As such, when they realised that there is a missing equipment, it might already be too late.

The most commonly missing equipment is the ammunition as they are the expendable components of firearms and they are of high demand. Conventionally, the ammunition is stored in an ammunition box and the box is subsequently stored in the cabinet. There are a few patented technologies over the prior art relating to the ammunition box. Of interest in respect to an ammunition storage container is US8997977B2. This patent discloses a storage container comprises a first member and a second member. The storage container includes at least one securing device that releasably secures the two members together. The first and second members each have interior portions. The

second member is configured to enter the interior portion of the first member. A first element of the securing device is configured on the first member and a second element of the securing device is configured on the second member. The securing device is configured to releasably secure the first member to the second member when the first member is slid over the second member. In some embodiments, the securing device automatically secures the first member with the second member when the first member is slid over the second member. Nonetheless, such storage container still lacks of the capability of ammunition detection.

Accordingly, it would be desirable to provide a method and system that is capable of overcoming the abovementioned drawbacks. This invention provides such a storage container and system thereof.

SUMMARY OF INVENTION

In one aspect of the invention, there is provided a storage container comprises a housing having two opposing side walls and a rear wall located at a rear end of the side walls; a door unit located at a front end of the side walls, being configured to move between an open position where an entrance into the housing is permitted and a closed position where the entrance is partially or entirely obstructed; a holder unit disposed between the door unit and the rear wall, having a plurality of article holding slots for one or more articles to be fittably suspended thereon between the door unit and the rear wall; a plurality of sensor units located at the rear wall, respectively configured to detect a presence of the articles that are suspended on each of the article holding slots; a lock mechanism for securing the door unit in the closed position; and a trigger mechanism which is engageable with the lock mechanism to release the door unit from the closed position. Preferably, the articles can be ammunition.

Preferably, the storage container can be sized to be inserted into a cartridge storage of

a cabinet.

In one aspect of the invention, the storage container may further comprise a wireless power transfer system for supplying electricity wirelessly to the sensor units.

Preferably, the wireless power transfer system may comprise a power source, a transmitter coil connected to the power source and a receiver coil connected to the sensor units, whereby the transmitter coil is positioned within the cartridge storage of the cabinet and the receiver coil is incorporated within the storage container such that power from the power source is wirelessly transmitted to the sensor units upon the insertion of the storage container into the cartridge storage.

Preferably, the sensor units can be further coupled with a data transmitter for transmitting sensor data wirelessly to a processing unit and the processing unit is further connected to a cloud server via a network communication.

Preferably, the sensor units can be inductive sensors, capacitive sensors, pneumatic sensors, magnetic sensors, photoelectric sensors, ultrasonic sensors or in any combination thereof.

Preferably, the rear wall may include a first through hole, the holder unit includes a second through hole that are aligned with the first through hole, and the door unit is a see-through door unit so that a user can see through the storage container.

Preferably, the lock mechanism may include a lever latch pivotally hinged to at least one side wall of the housing, and a spring unit to resiliently biase the lever latch to a locking position where a hook at a first end of the lever latch is engageable with an anchor within a recess on the door unit when the door unit is moved to the closed position.

Preferably, the trigger mechanism may include an elongate beam that is connected to a second end of the lever latch such that an external force that is acted on the elongate beam will cause the lever latch to biase towards an unlocking position where the hook at the first end of the lever latch can be disengaged from the anchor within the recess on the door unit.

One skilled in the art will readily appreciate that the invention is well adapted to carry out the objects and obtain the ends and advantages mentioned, as well as those inherent therein. The embodiments described herein are not intended as limitations on the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

For the purpose of facilitating an understanding of the invention, there is illustrated in the accompanying drawing the preferred embodiments from an inspection of which when considered in connection with the following description, the invention, its construction and operation and many of its advantages would be readily understood and appreciated.

Fig. 1 is a front perspective view of a storage container.

Fig. 2 is a rear perspective view of the storage container.

Fig. 3 is a see-through rear perspective view of the storage container where its door unit is in a closed position.

Fig. 4 is a see-through front perspective view of the storage container where its door unit is in an open position.

Fig. 5 is a see-through side view of the storage container illustrating a lock mechanism.

Fig. 6 is a block diagram illustrating a power transfer system and/or data transfer system.

DETAILED DESCRIPTION OF THE INVENTION

The invention will now be described in greater detail, by way of example, with reference to the drawings.

Referring to **Figs. 1** to **4**, a storage container as illustrated therein generally comprises a housing that has two opposing side walls **1, 2** and a rear wall **3** located at a rear end of the side walls **1, 2**, a door unit **4** located at a front end of the side walls **1, 2**, a holder unit **5** disposed between the door unit **4** and the rear wall **3** for holding a plurality of articles **7**, a plurality of sensor units **8** located at the rear wall **3** for detecting presence of the articles **7**, a lock mechanism **12** for securing the door unit **4** in the second position, and a trigger mechanism **11** for releasing the door unit **4** from the second position. Preferably, the side walls **1, 2** and the rear walls **3** can be made of rigid material such as metal, hard plastic or the like. By way of example, the housing may have a top opening, bottom opening, and a front opening. The door unit **4** is hinged at a lower section of the front opening, being configured to move or swing between an open position where an entrance into the housing is permitted and a closed position where the entrance is partially or entirely obstructed.

Preferably, the holder unit **5** is in the form of a board panel extending from one side wall **1** to the other side wall **2** of the housing. The holder unit **5** comprises a plurality of article holding slots **6** for one or more articles **7** to be fittably suspended thereon

between the door unit **4** and the rear wall **3**. By way of example, the articles **7** are ammunition such as bullets, shells, projectiles, missiles, bombs and etc. It should be noted that articles **7** can be any types of items as long as the items can be held by the slots **6**. As shown in **Figs. 1** to **4**, the slots **6** are in the form of through holes on the holder unit **5** that allows at least partial of the article body to pass through the slots **6** and reaches the rear wall **3**.

Preferably, the plurality of sensor units **8** can be embedded internally within the rear wall **3** or attached externally on the rear wall **3**. Position of each sensor unit **8** is aligned with a respective slot **6** such that a present of an article **7** suspended within the respective slot can be detected in a wirelessly. The sensor units **8** can be proximity sensors, ultrasonic sensors, capacitive sensors, photoelectric sensors, inductive sensors, magnetic sensors or any combination thereof. Depending on the type of sensors employed, the rear wall **3** can be provided with a thinned wall, arrays of holes, or made of suitable material for the object detection. Alternatively, the articles **7** may be required to engage with their respective sensor units **8** in order for the sensor units **8** to detect the existence of the corresponding articles **7**.

Referring to **Fig. 5**, an embodiment of the locking mechanism **12** is disclosed. By way of example, the locking mechanism **12** includes a lever latch **13** pivotally hinged within each side wall **1, 2** of the housing via pivots **14**, and a spring unit **15** disposed at a second end of the lever latch **13** to resiliently biase the lever latch **13** to a locking position where a hook **16** at a first end of the lever latch is engageable with an anchor **17** within a recess on the door unit **4** when the door unit is moved to the closed position. The trigger mechanism **11** includes an elongate beam that is connected to the second end of the lever latch **13** such that an external force that is acted on the elongate beam will cause the lever latch **13** to biase towards an unlocking position where the hook **16** at the first end of the lever latch **13** can be disengaged from the anchor **17** within the recess on the door unit. The elongate beam can be partially

concealed within the rear wall **3**, and only reveals a portion of the elongate beam for user to exert the external force thereon.

In operation, the storage container can be sized to be inserted into a cartridge storage of a cabinet. In this embodiment, the storage container can be wireless powered by the cabinet via a wireless power transfer system and data within the sensor units **8** can also be transmitted wirelessly to a processing unit **19** via a data transfer system. The processing unit **19** may include but are not limited to portable media players, cellular telephones, pocket-sized personal computers, personal digital assistants ("PDAs"), desktop computers, laptop computers, and/or tablet computers. The processing unit **19** may also include control circuitry, storage, memory, communications circuitry, input and/or output interfaces as well as any of the additional features.

Referring to **Fig. 6**, the wireless power transfer system and/or the data transfer system as illustrated. Preferably, the wireless power transfer system may generally comprises comprise a power source (not shown), a transmitter coil **21** connected to the power source and a receiver coil **20** connected to the sensor units **8**. The transmitter coil **21** can positioned within the cartridge storage of the cabinet and the receiver coil **20** can be incorporated within the storage container such that power from the power source is wirelessly transmitted to the sensor units **8** upon the insertion of the storage container into the cartridge storage. Similarly for the data transfer system, the transmitter coil **21** and the receiver coil **20** can be further used to transmit data from the sensor units **8** to the processing unit **19**. Alternatively, the storage container can be provided with one or more electrical contacts which can be engaged with one or more complimentary electrical contracts at the cabinet so that the power or data transfer circuits can be established for supplying power to the storage container and data transfer.

Preferably, the processing unit **19** can be further connected to a cloud server via a

network communication. The network communication can be a wireless network connection established via a wireless protocol cloud such as Long-Term Evolution (LTE) cloud, Code Division Multiple Access (CDMA) and its derivatives, Enhanced Data Rates for GSM Evolution (EDGE), 3G protocol, High Speed Packet Access (HSPA), 4G protocol, 5G protocol and the like, in accordance to the advancement of wireless technology with time. The network communication can also be a wired network in which the communication is established through a local network port.

In one alternative embodiment, the cartridge storage can be configured to receive multiple similar types of containers. In this embodiment, the rear wall **3** includes a first through hole **10**, the holder unit **5** includes a second through hole **9** that are aligned with the first through hole **10**, and the door unit **4** made of see-through material such as bulletproof glass so that the user can see through the storage container to observe items within other containers.

The present disclosure includes as contained in the appended claims, as well as that of the foregoing description. Although this invention has been described in its preferred form with a degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangements of parts may be resorted to without departing from the scope of the invention.

CLAIMS

1. A storage container comprising:

a housing having two opposing side walls (1, 2) and a rear wall (3) located at a rear end of the side walls (1, 2);

a door unit (4) located at a front end of the side walls (1, 2), being configured to move between an open position where an entrance into the housing is permitted and a closed position where the entrance is partially or entirely obstructed;

a holder unit (6) disposed between the door unit (4) and the rear wall (3), having a plurality of article holding slots (6) for one or more articles (7) to be fittably suspended thereon between the door unit (4) and the rear wall (3);

a plurality of sensor units (8) located at the rear wall (3), respectively configured to detect a presence of the articles (7) that are suspended on the respective article holding slots (6);

a lock mechanism (12) for securing the door unit (4) in the closed position; and

a trigger mechanism (11) which is engageable with the lock mechanism (12) to release the door unit (4) from the closed position.

2. The storage container according to claim 1, wherein the storage container is sized to be inserted into a cartridge storage of a cabinet.

3. The storage container according to claim 2, further comprising a wireless power transfer system for supplying electricity wirelessly to the sensor units (8).

4. The storage container according to claim 3, wherein the wireless power transfer system comprises a power source, a transmitter coil (21) connected to the power source and a receiver coil (20) connected to the sensor units (8), whereby the transmitter coil (21) is positioned within the cartridge storage of the cabinet and the receiver coil (20) is incorporated within the storage container such that power from

the power source is wirelessly transmitted to the sensor units (8) upon the insertion of the storage container into the cartridge storage.

5. The storage container according to claim 3, wherein the sensor units (8) are further coupled with a data transfer system for transmitting sensor data wirelessly to a processing unit (19) and the processing unit (19) is further connected to a cloud server via a network communication.

6. The storage container according to claim 1, wherein the sensor units (8) are inductive sensors, capacitive sensors, pneumatic sensors, magnetic sensors, photoelectric sensors, ultrasonic sensors or in any combination thereof.

7. The storage container according to claim 1, wherein the rear wall (3) includes a first through hole (10), the holder unit (5) includes a second through hole (9) that are aligned with the first through hole (10), and the door unit (4) is a see-through door unit so that a user can see through the storage container.

8. The storage container according to claim 1, wherein the lock mechanism (12) includes a lever latch (13) pivotally hinged to at least one side wall (1, 2) of the housing, and a spring unit (15) to resiliently biase the lever latch (13) to a locking position where a hook (16) at a first end of the lever latch (13) is engageable with an anchor (17) within a recess on the door unit (4) when the door unit (4) is moved to the closed position.

9. The storage container according to claim 8, wherein the trigger mechanism (11) includes an elongate beam that is connected to a second end of the lever latch (13) such that an external force that is acted on the elongate beam will cause the lever latch (13) to biase towards an unlocking position where the hook (16) at the first end of the lever latch (13) can be disengaged from the anchor (16) within the recess on the door

unit (4).

10. The storage container according to claim 1, wherein the articles (7) are ammunition.