FIELD OF THE INVENTION

This invention relates to a security device for asset management including containers.

BACKGROUND OF THE INVENTION

The integrity of a container is of paramount importance having regard to theft or the importation of dangerous matter such as explosives, poisons, radioactive material and the like. Many ideas have been propounded to eliminate or at least reduce the risk of containers and trucks having their contents stolen or bearing illicit goods without an indication, or only a delayed indication, of the breakage of the seal or seals of the container. It is often a situation of locking the door after the horse has bolted.

In USP 6331022 a cable seal is provided that seals the container and locks the security bar. In US 6536815 the bar and bracket are covered in a textured baked-on powder coat. A thief may cut the bar and try to weld it together again to disguise the fact that the bar had been cut. Both of these patents rely on a visual check and therefore to human error.

In USP 7019683 a container includes a system that senses an intrusion into the container. The sensing is provided by range-gated micro-impulse radar that generates microwave pulses that bounce around the interior of the container and the reflected signals are measured at the exit gate. The system relies on the Doppler Effect and is complicated and, as far as the applicant is aware, has not been used extensively if at all.

Terminal management systems (TMS) used at present includes a camera-captured photograph of the container ID and of the truck ID, in combination with a locking bolt that displays an ID. The problem is that the latter ID is not camera-captive because of its small size and this requires a close-up visual inspection and recordal. This adds time to the clearing facility of the check

point and, in instances in which there are two containers on the same truck and their doors are facing each other, the visual inspection is very difficult if not impossible.

It is an object of the present invention to provide a system that avoids or at least greatly minimises the difficulties and problems outlined above.

THE INVENTION

According to the invention a container seal security device includes a locking unit adapted to span a conventional locking bolt (or other container seal), and having a RFID facility linked electronically with at least one code associated with the locking bolt ID and/or the container ID and/or the truck ID.

The device may have a unique secure encrypted electronic ID embedded in the RFID microchip or the like as well as a random device number that is embossed on the unit for visual purposes, if necessary. These two numbers are automatically linked and stored in the database of the device during manufacture.

In a preferred form of the invention the device has one or more RFID components having individual ID code/s readable by a RFID reader, the device including a zone that is fracturable whereupon

a. the ID code/s become unreadable and the truck will not therefore be able to pass a check point, or
b. if the truck has successfully passed a check point, the container may be lawfully entered.

In the event (a.) an alarm, recordal or tracking apparatus may be activated to indicate an unauthorised fracture of the device; as well as immobilising the system for "No Read" by the reader.

In a preferred form of the invention a pair of RFID facilities is provided, each of the pair having an antenna, at each end of the device, and each having a

code or codes corresponding to one or more of the codes associated with the locking bolt, container or truck. Thus if either end (top or bottom) of the device is fractured a NO READ situation will result.

The device of the invention effectively shields the locking bolt or other seal and obviates the previous requirement for a visual inspection. The RFID may be the same as or convertible to the locking bolt ID.

The device may be self-locking so that it can only be removed by cutting or other force, and thereby fracturing it .

The device of the invention may be used withy any systems worldwide thereby providing adequate security for intercontinental movement.

In an example of the invention the RFID may comprise or include a 32-bit authentication identifier, with an extensible EPC memory bank, a scalable user memory bank and a password-protected read and write support capabilities.

The device of the invention is preferably supplied and affixed by the packer of the particular container. Check points, such as harbour or yard terminals will be equipped for reading the devices, and it will be appreciated that it is not possible to counterfeit any device because of the use of a large number, for example 32 bit codes.

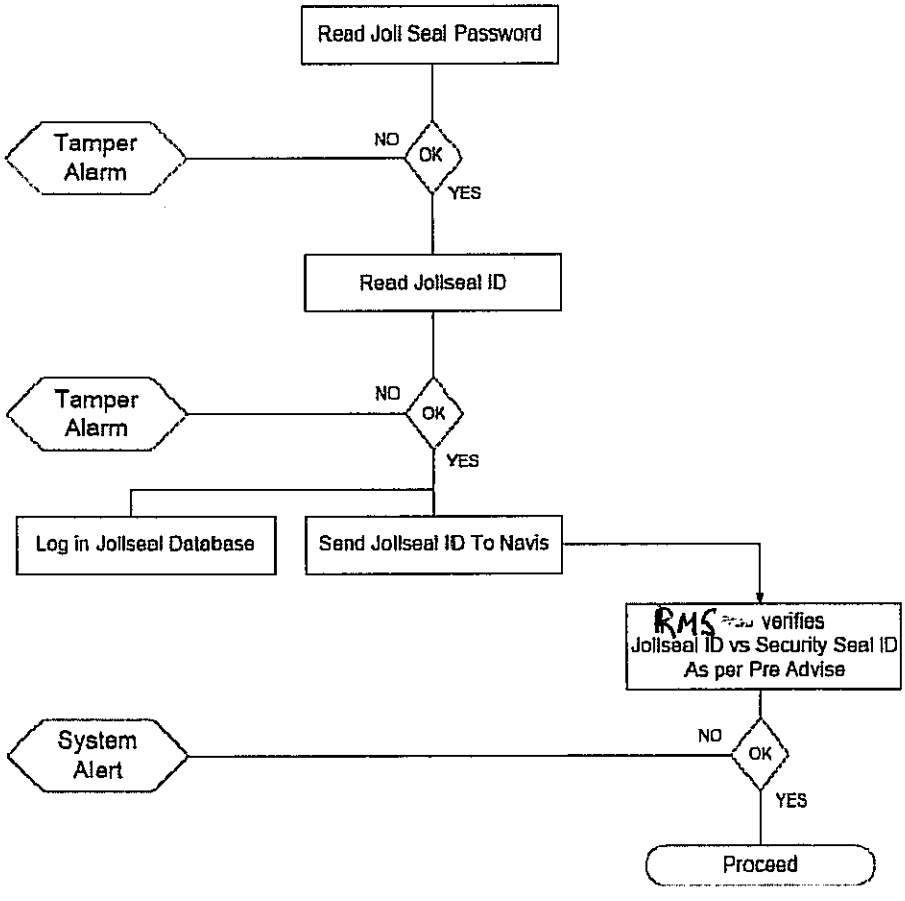
The RF communication interface and reader commanded functionality requirements for Class 1 RFID tag operating in the frequency range of 860-930 MHz. A Class 1 tag is designed to communicate only its unique identifier and other information required to obtain the unique identifier during the communication process.

In use a fixed RFID reader is located at strategic points, such as a port entrance, exit, yard entrance and exit as well as boundary or customs posts.

The device may include additional data relating to location, date/time and any other pertinent information. This data may be relayed to a central point which preferably has an interface with the TMS, Customs, SARS.

A schematic flow sheet illustrating the operation of the system is shown below.

FLOWSHEET



EMBODIMENT OF THE INVENTION

An embodiment of the invention is described below with reference to the accompanying drawings, in which:

Figure 1 is an isometric view of one portion of the device according to the invention;
Figure 2 is a similar view showing the first portion attached to the second portion;
Figure 3 is a similar view showing the device in position of use;
Figure 4 is a cross sectional view on Figure 3;
Figure 5 is cross sectional view indicating the location of the chips and antennae;
and
Figure 6 is a photograph of the device in position on an existing container seal system.

In the drawings the term Jollseal is the trade mark for the device of the invention.

The device is manufactured in two portions , the lower portion 10 (see Figure 1) having a holder 12 for the tag of a locking bolt 14 (See particularly Figures 3 and 4) and a stem 16 that has ratchet formations 18.

The ratchet formations are pressed into the top portion 20 of the device through the orifice 22 thus forming a solid engagement (see again Figures 3 and 4).

In use, as shown in Figures 3, 4 and 5 the locking bolt 14 is held in the holder 12 and the space 24 (see Figure 4). The identity number of the bolt is shown at 26. A bracket 28 completes the device which is fitted to a door of the container and which accepts the release lever 30 of the container shown in Figure 5 and also in Figures 3 and 4.

The circuitry of the device is shown in Figure 5. A first chip 32 has an antenna 34 in the top portion of the device while a second chip 36 has its antenna 38 in the lower portion. The identical ID is programmed to both of the chips. When the device is in the range of a reader, it will be prompted for a password. Once the password is confirmed the reader will prompt for two identical IDs so that if either portion is damaged or not present, the IDs will not match and an alarm will be initiated. If both IDs are read successfully, the reader will transfer the ID to the TMS.

Dated this 19 day of October 2010

MORRISON FORSTER INC.
APPLICANTS' PATENT ATTORNEYS

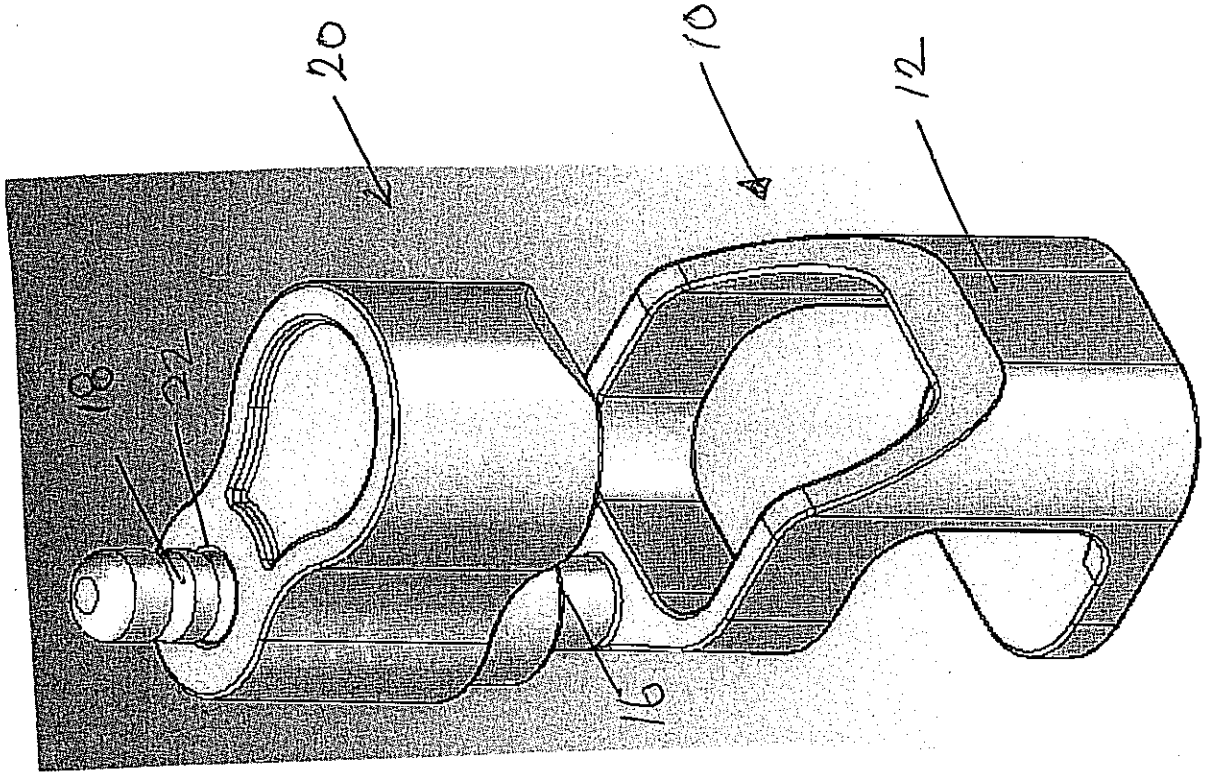


FIG 2

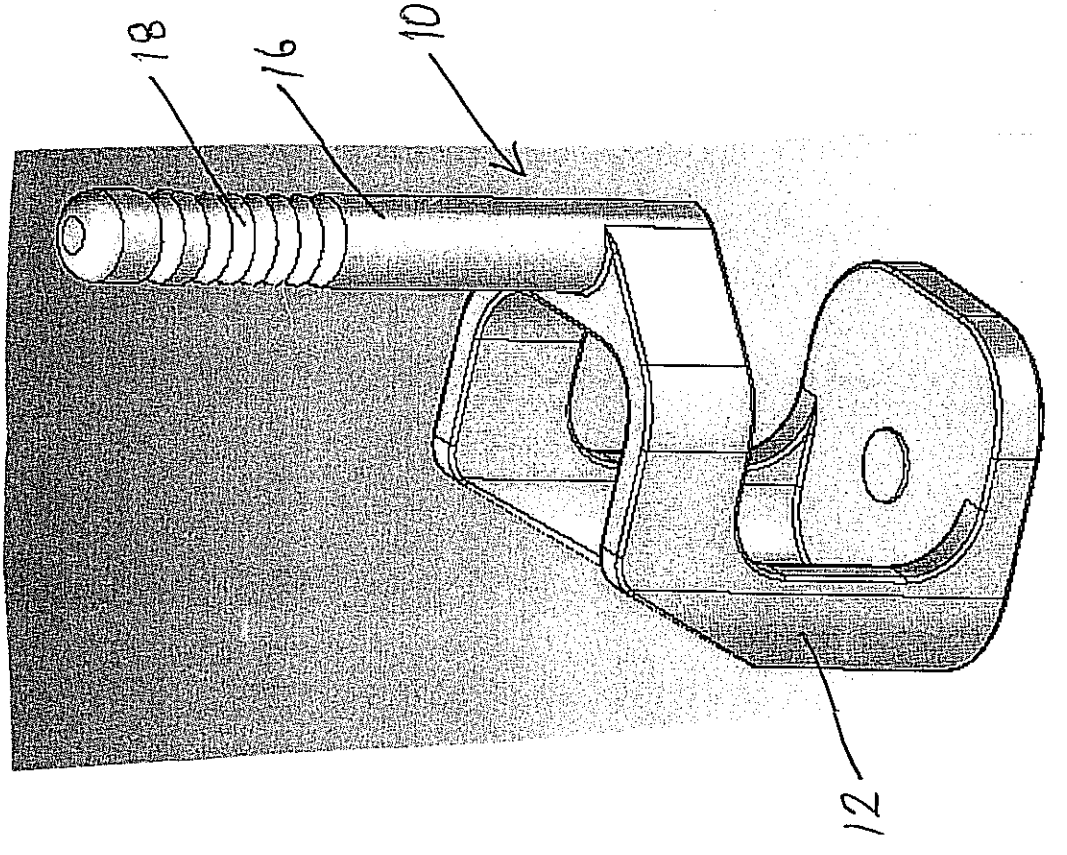


FIG 1

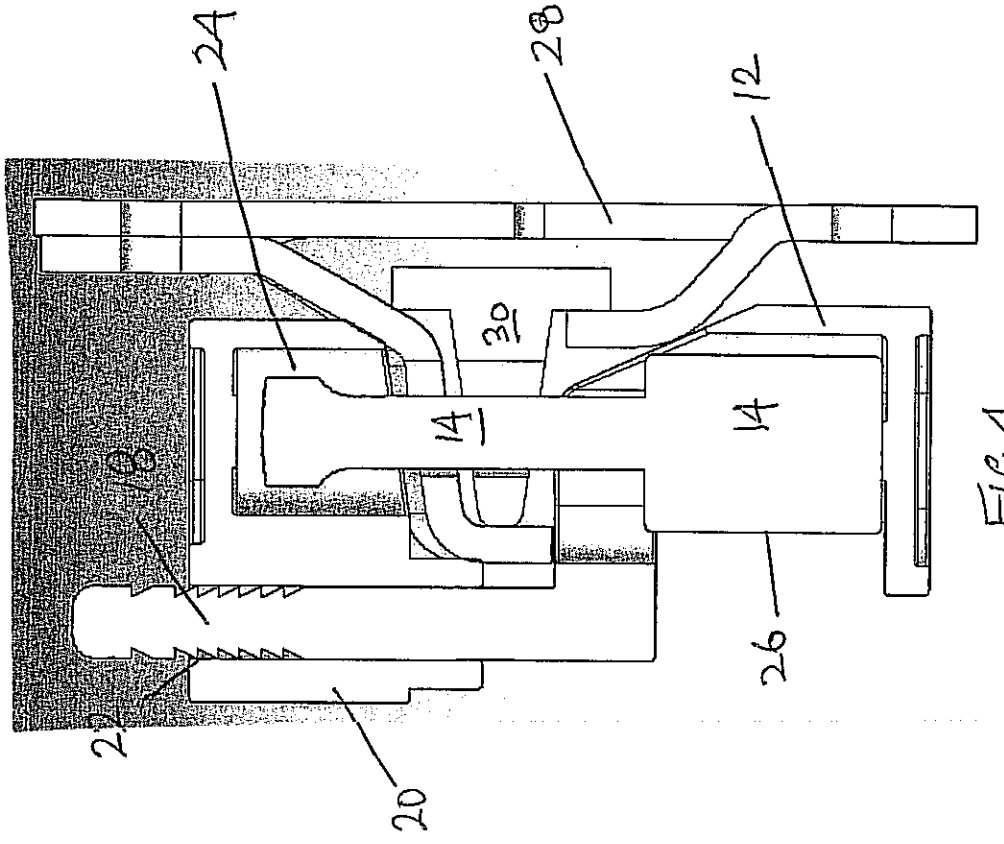


FIG 4

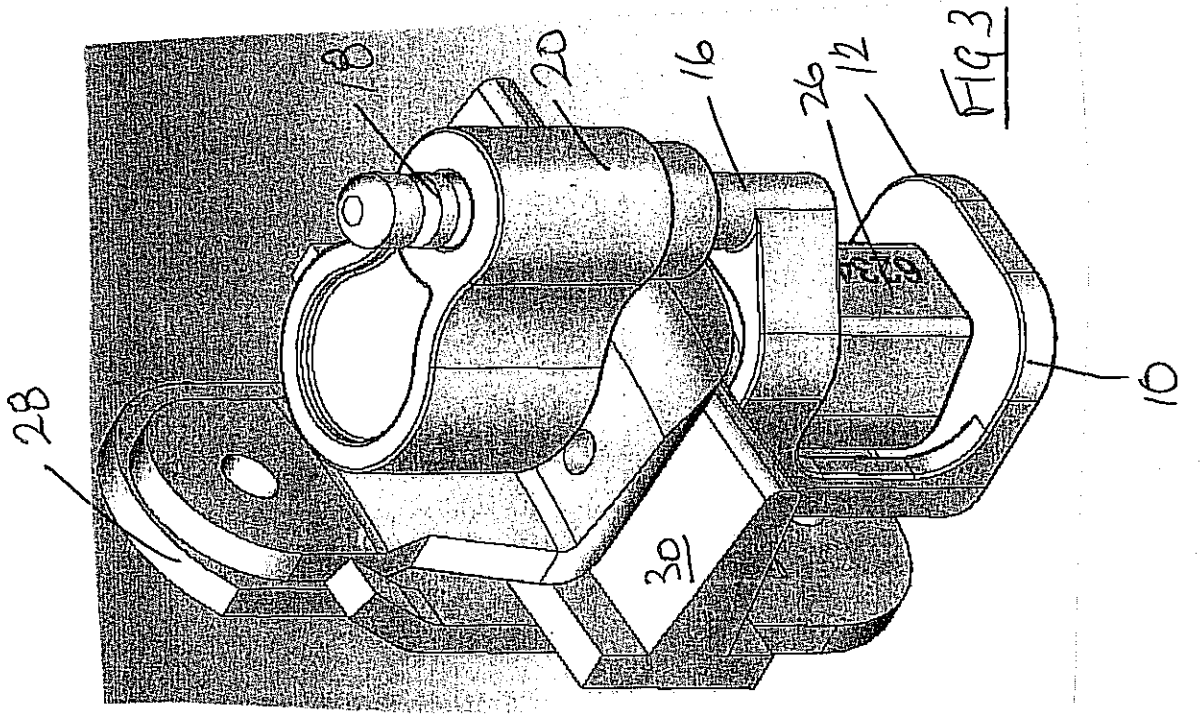


FIG 3

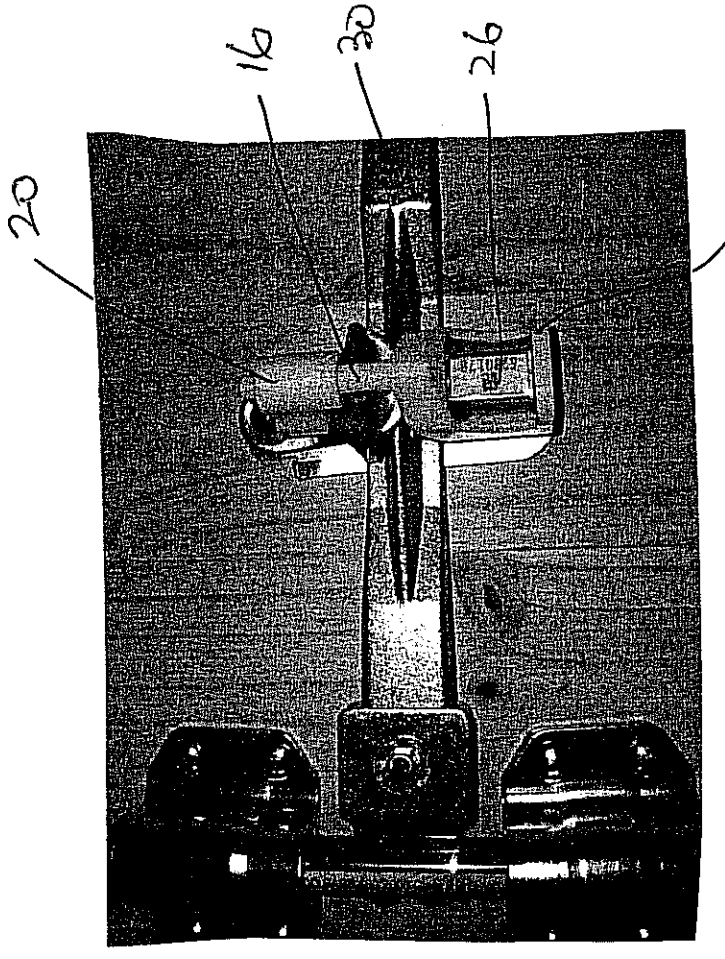


FIG 6

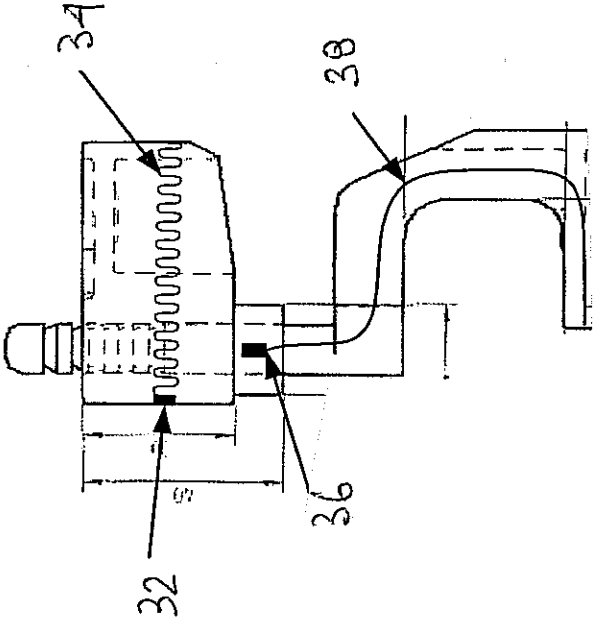


FIG 5