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(72) Inventors:  
• **Westington, Anthony**  
**Saltash, Cornwall PL12 6LF (GB)**  
• **Tripp, Nick**  
**Saltash, Cornwall PL12 6LF (GB)**

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(74) Representative: **Hall, Christopher David**  
**Withers & Rogers LLP**  
**4 More London Riverside**  
**London, Greater London SE1 2AU (GB)**

(71) Applicant: **Spinnaker International Limited**  
**Saltash, Cornwall PL12 6LF (GB)**

(54) **A secure bag and a secure container**

(57) A secure bag (10) comprising first and second opposed body panels (12, 14) that are attached to each other along opposed sides thereof, the first and second opposed body panels (12, 14) being connected to each other at one end thereof to form a closed end (16) of the

secure bag, a mouth formed at the end (18) of the first and second body panels (12, 14) opposed to the closed end (16), closing means for closing the mouth, and a locating tab (38) for correctly locating the bag in a secure container (50).

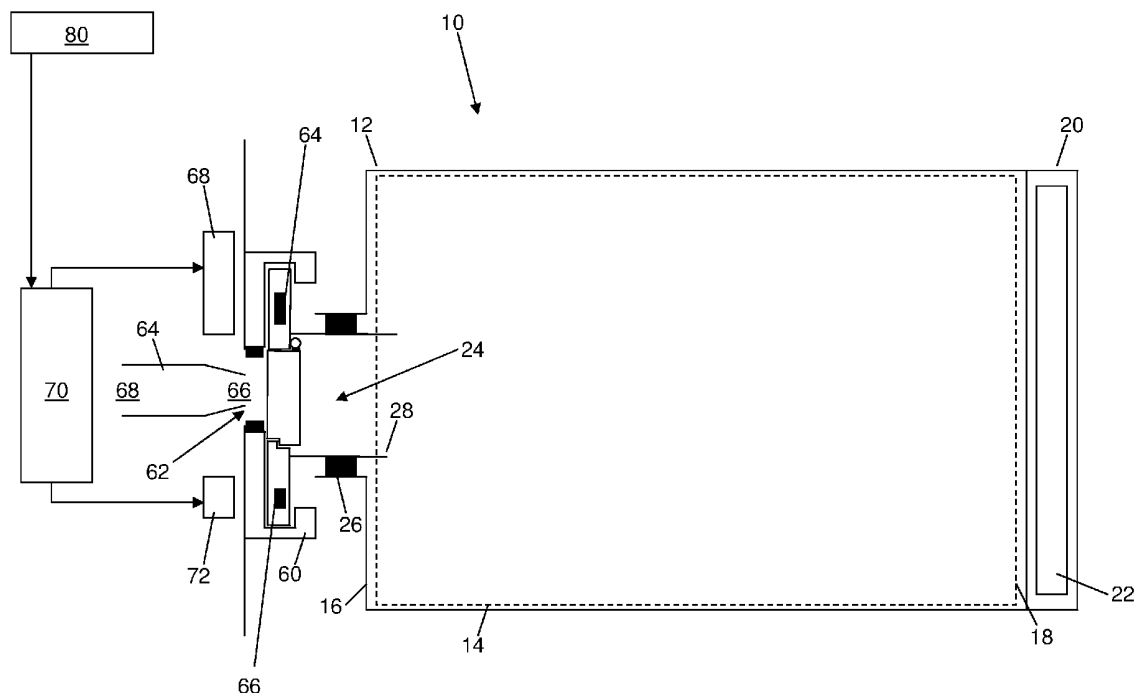


Figure 1

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## Description

### Technical Field

**[0001]** The present invention relates to a secure bag and to a secure container in which such a secure bag can be received for transport or storage of the contents of the secure bag.

### Background to the Invention

**[0002]** In the cash in transit industry security is a major concern, as cash being transported between secure locations such as a cash depot and a bank or other delivery destination is an attractive target to criminals.

**[0003]** A number of measures are typically employed to deter criminals from attempting to steal cash in transit. For example the cash, which is typically in the form of bank notes, is usually transported in a safe or other secure container of an armoured delivery vehicle and is only removed from the safe for the usually short final phase of the delivery, when a delivery guard walks from the delivery vehicle to the delivery destination carrying the cash. In this final phase of the delivery the cash is typically protected by a secure container (often referred to as a cash in transit container) that is equipped with a security system which is able to detect when a theft or attempted theft is taking place and trigger a spoiling system to dispense a spoiling agent such as an indelible ink or dye, an adhesive or resin or some other degrading agent onto the bank notes within the secure container, to render them worthless and unusable.

**[0004]** To deter employees of cash depots, cash in transit companies and delivery destinations such as banks, bank notes to be transported in this way are often stored in tamper-evident sealed bags. Thus, any unauthorised attempt to access the bank notes at any point in their transportation from the cash depot to the delivery destination can be detected and investigated.

**[0005]** In order to function correctly, the spoiling system of a cash in transit container used to transport bank notes in these tamper-evident sealed bags must be able to breach the bag before dispensing the spoiling agent onto the bank notes contained in the sealed bag.

**[0006]** Some systems use a pyrotechnic device to burn or melt the sealed bag to expose the bank notes, before a second pyrotechnic device is used to burst or breach a bag or other container containing a spoiling agent such as an ink, dye or the like. The spoiling agent is released onto the bank notes and renders them worthless and unusable.

**[0007]** A problem with systems of this type is that the hole created in the sealed bag by the first pyrotechnic device may not be large enough to ensure that the spoiling agent reaches all of the bank notes. Thus, some of the bank notes may remain usable after the spoiling system has been activated. A further problem with systems of this type is that the release of the spoiling agent is not

very controlled, so some of the spoiling agent may not even reach the interior of the sealed bag, as it may be directed away from the bag during its release. This is inefficient, as some of the spoiling agent is wasted, and can lead to ineffective spoiling of some or all of the bank notes, which may leave some of the bank notes usable after the spoiling system has been activated.

**[0008]** An alternative approach is the use of injectors which pierce the sealed bag before dispensing the spoiling agent into the interior of the bag to spoil its contents. Although such systems are typically more effective than the pyrotechnic-based systems described above, they may not be effective when bags of bank notes are stacked on top of each other, since the injectors may only pierce one of the bags. In such circumstances multiple injectors are required on all faces of the secure container, which presents considerable technical challenges and cost issues.

**[0009]** In addition to these disadvantages, in the event that a spoiling system of either of the types described above is inadvertently activated when the secure container is open there is a risk that the spoiling agent may be dispensed onto property or personnel, causing damage or injury.

**[0010]** Accordingly, there is a requirement for an alternative to the known systems for spoiling bank notes and other valuable items that are stored in tamper-evident sealed bags which addresses the problems described above.

### Summary of Invention

**[0011]** According to a first aspect of the present invention there is provided a secure bag comprising: first and second opposed body panels that are attached to each other along opposed sides thereof, the first and second opposed body panels being connected to each other at one end thereof to form a closed end of the secure bag; a mouth formed at the end of the first and second body panels opposed to the closed end; closing means for closing the mouth; and a locating tab for correctly locating the bag in a secure container.

**[0012]** The secure bag of the first aspect of the present invention can be used to store bank notes and other valuable items in a tamper-evident manner. The locating tab aids the correct location of the secure bag within the secure container, such that the secure bag can be consistently positioned at the same location within the container. The locating tab allows dispensing means of a compatible spoiling agent delivery system to be received through seal means such that the spoiling agent can be dispensed into an interior of the secure bag. Thus, when the secure bag is used in conjunction with a compatible spoiling agent dispensing system the bag need not be breached to spoil its contents, but instead the spoiling agent can be delivered directly to the interior of the bag, which increases the coverage of the contents of the bag by the spoiling agent. The seal means prevents or im-

pedes the spoiling agent from escaping from the bag, which further improves the coverage of the contents of the bag, as all of the spoiling agent is dispensed into the bag so none is wasted. Additionally, in the event that the dispensing system is inadvertently activated when the secure container is open all of the spoiling agent is dispensed into the bag and thus the risk of damage or injury to property or personnel is reduced.

**[0013]** The seal means may comprise a valve.

**[0014]** The valve may be a one-way valve.

**[0015]** The one way valve may comprise a swing type wafer check valve.

**[0016]** The one way valve is preferably biased towards a closed position. This ensures that the one way valve remains closed when not in use, and returns to a closed position after it has been used, to prevent a spoiling agent that has been dispensed into the secure bag from escaping.

**[0017]** Alternatively, the seal means may comprise a diaphragm.

**[0018]** The diaphragm may be provided with zones of weakness. These promote tearing of the diaphragm in the correct places when the dispensing means of the compatible spoiling agent dispensing system is activated.

**[0019]** In further embodiments of the present invention, the locating tab may comprise a wireless communication device.

**[0020]** For example, the wireless communication device may comprise an RFID tag. The RFID tag can be detected by an RFID reader of the secure container to confirm that the secure bag is correctly received in the secure container.

**[0021]** Additionally or alternatively, the locating tab may comprise a detectable component.

**[0022]** For example, the detectable component may comprise magnet means. The magnet means can be detected by a sensor of the secure container and provides an additional or alternative way of verifying that the secure bag is correctly received in the secure container.

**[0023]** In some embodiments the closing means may be reusable. This permits re-use of the secure bag, thereby reducing the cost and negative environmental impact of cash in transit operations.

**[0024]** The secure bag may further comprise sealing means for sealing the bag closed.

**[0025]** The sealing means or the closing means may be tamper-evident. This ensures that any unauthorised attempt to open the bag can be detected.

**[0026]** The secure bag may further comprise means for storing a unique identifier of the secure bag.

**[0027]** For example, the means for storing the unique identifier may comprise a read-only memory.

**[0028]** The locator tab may comprise an interface for connecting to a device for reading the read-only memory.

**[0029]** Alternatively or additionally, the means for storing the unique identifier may comprise a barcode.

**[0030]** According to a second aspect of the invention

there is provided a secure container for storing or transporting a secure bag, the secure container comprising a dispensing system for dispensing a spoiling agent into an interior of the secure bag, and docking means for receiving a locating tab of the secure bag such that the secure bag is correctly located in the secure container. This assists in correctly locating the secure bag within the secure container.

**[0031]** In embodiments of the present invention, the dispensing system comprises a dispenser that is moveable between an inactive position in which the dispenser is located outside of the secure bag and an active position in which the dispenser is located in an interior of the secure bag.

**[0032]** The secure container may further comprise means for reading a unique identifier of the secure bag.

**[0033]** For example, the means for reading the unique identifier may comprise an interface and a device for reading a read-only memory of the secure bag.

**[0034]** Additionally or alternatively, the means for reading the unique identifier may comprise a barcode reader.

**[0035]** The means for reading the unique identifier may comprise a wireless receiver for reading a wireless device of the secure bag.

**[0036]** For example, the wireless receiver may comprise an RFID reader for reading an RFID tag of the secure bag.

**[0037]** The secure container may further comprise detector means for detecting a detectable component of the secure bag.

**[0038]** For example, the detector means may comprise magnetic detector means for detecting magnet means of the secure bag.

**[0039]** The spoiling agent may comprise ink, dye, adhesive or resin.

**[0040]** Additionally or alternatively the spoiling agent may comprises a unique marker.

**[0041]** The unique marker may comprise DNA.

**[0042]** The secure container may further comprise wireless communication means for communicating with a remote management system.

**[0043]** Additionally or alternatively, the secure container may further comprise communication means for communicating with a storage rack or vehicle in which the secure container may be received.

**[0044]** According to a third aspect of the invention there is provided a system for storing or transporting valuable items, the system comprising a secure bag according to the first aspect for receiving a valuable item and a secure container according to the second aspect for receiving the secure bag.

#### Brief Description of the Drawings

**[0045]** Embodiments of the invention will now be described, strictly by way of example only, with reference to the accompanying drawings, of which:

Figure 1 is a schematic representation of a secure bag according to one embodiment of an aspect of the present invention, received in receiving means of a secure container, with a dispensing means of the secure container in an inactive position;

Figure 2 is a schematic representation illustrating a valve assembly of the secure bag of Figure 1;

Figure 3 is a schematic representation of the secure bag shown in Figure 1 received in the receiving means of the secure container, with the dispensing means of the secure container in an active position;

Figure 4 is a schematic plan view of a secure container in accordance with an embodiment of a second aspect of the invention;

Figure 5 is a schematic cross-sectional view of the secure container of Figure 3;

Figure 6 is a schematic representation of part of a secure bag according to an alternative embodiment of the invention; and

Figure 7 is a schematic representation of a diaphragm used in the secure bag illustrated in Figure 6.

#### Description of the Embodiments

**[0046]** Referring first to Figure 1, a secure bag is shown generally at 10, and comprises a first body panel 12 and an opposed second body panel 14 (shown in dashed outline in Figure 1). The first and second body panels 12, 14 in this example are of a flexible plastics material. The opposed first and second body panels 12, 14 are attached to each other at opposite sides by, for example, a seal or weld. The first and second opposed body panels 12, 14 are also connected to each other at a first end 16 thereof, again by a seal or weld for example, whilst an opposite end 18 of the bag 10 is open, forming a mouth through which items such as bank notes can be inserted into the bag 10.

**[0047]** The first body panel 12 is longer than the second body panel 14, and the excess material forms a flap 20 which can be used to close and seal the bag 10. The flap 20 is provided on its inner surface with one or more strips or patches of adhesive 22 which are covered by one or more removable covers such as strips of paper treated with silicone or another non-stick material. When the bag 10 is to be closed and sealed the removable cover(s) are removed from the strips or patches of adhesive 22 and the flap 20 is folded over to close the mouth and to bring the adhesive into contact with an outer surface of the second body panel 14, thereby sealing the bag 10 closed.

**[0048]** The adhesive 22 or the flap 20 may be tamper evident. For example, the adhesive 22 may change colour when pressure, heat, cold or solvents are applied to

it, to indicate when an attempt has been made to open the bag 10.

**[0049]** In an alternative embodiment the bag 10 may be provided with re-useable closing means such as a zip or similar closure to close the mouth at the open end of the bag 18. In this case the zipper may be provided with a lock or similar retaining means that cannot be removed without leaving a visual indication of the removal of the lock to provide evidence of tampering with the zip. Alternatively or additionally the zip or other closure may be sealed using an adhesive label which may itself be tamper-evident, for example changing colour when exposed to pressure, extremes of temperature or solvents. When provided with reusable closing means in this way the bag 10 can be reused many times, helping to reduce the cost and negative environmental impact of cash in transit operations.

**[0050]** The first end 16 of the bag 10 is provided with receiving means for receiving dispensing means of a spoiling agent dispensing system of a secure container in which the bag 10 may be received. In this example the receiving means takes the form of a valve assembly, shown generally at 24 in Figure 1. The valve assembly 24 is attached to the bag 10 by an ultrasonic weld 26, which seals a frame 28 of the valve assembly 24 to the bag 10 in a secure and fluid-tight manner. It will be appreciated by those skilled in the art that any other method of attaching and sealing the valve assembly 24 to the bag 10 may also be used, provided that the valve assembly 24 and the bag 10 are sealed together in a secure and fluid-tight manner.

**[0051]** The valve assembly 24 is best illustrated in Figure 2, and includes a one way valve, which in this example is a swing type wafer check valve 30, although it will be appreciated that other types of one way valve such as a diaphragm or disc check valve, for example, may also be used. The wafer check valve 30 includes a valve closure 32 which is pivotally mounted on a shaft for movement between closed and open positions and is biased towards the closed position by a spring 34. In the closed position, as shown in Figure 2, the valve closure 32 seals an aperture 36 of the valve assembly 24, whilst in the open position, which is illustrated in Figure 3, the aperture 36 is open to permit the entry of a dispensing means of a spoiling agent dispensing system, as is described below.

**[0052]** The valve assembly 24 includes a locator tab 38, which surrounds the aperture 36. The locator tab 38 is provided to assist in correctly positioning the bag 10 in a compatible secure container such as a cash in transit container, safe or the like.

**[0053]** Referring now to Figures 4 and 5, a secure container, which in this example is a cash in transit container, is shown generally at 50. The secure container 50 has a base part 52 to which a lid part 54 is hingedly attached to permit access to an interior of the secure container 50. The base part is provided with an enclosure for receiving a secure bag 10 of the type described above and illus-

trated in Figures 1 to 3. The secure bag 10 in this example contains a stack of bank notes 58.

**[0054]** The enclosure 56 of the secure container 50 is provided at one end with a docking slot or ring 60 for receiving the locator tag 38 of the secure bag 10. As can be seen from Figures 1 to 3, the docking slot or ring 60 has an aperture 62 which aligns with the aperture 36 of the valve assembly 24 of the secure bag 10 when the secure bag 10 is correctly positioned in the enclosure 56 of the secure container 50.

**[0055]** To facilitate the correct positioning of the secure bag 10 in the enclosure 56 and to assist in retaining the secure bag 10 in the correct position in the enclosure 56, the locator tab 38 of the secure bag 10 is substantially the same height as the internal height of the secure container 50, such that as the lid part 52 is closed, with the locator tab 38 received in the docking slot or ring 60, an underside of the lid part 52 engages with a free end of the locator tab 38 to urge it downward and into the correct position in the enclosure 56, in which the aperture 62 of the docking slot or ring 60 is aligned with the aperture 36 of the valve assembly 24 of the secure bag 10.

**[0056]** When the lid part 52 is fully closed its underside engages with the free end of the locator tab 38 to impede vertical movement of the locator tab 38 and thus of the secure bag 10, whilst the docking slot or ring 60 impedes lateral movement of the locator tab 38 and thus of the secure bag 10. Thus, when the secure bag 10 has correctly been installed in the secure container 50 and the lid part 52 is closed it cannot be moved out of the correct position.

**[0057]** To ensure that the locator tab 38 is located correctly in the docking slot or ring 60 (thus ensuring that the bag 10 is correctly located in the enclosure 56) rather than the bag 10 being placed in the enclosure 56 without correctly installing it in the docking slot or ring 60 the locator tab 38 includes a wireless communications device 64 such as an RFID (radio frequency ID) tag and a detectable component 66, e.g. a magnetic component such as a permanent magnet or a magnetised piece of magnetic material are provided in the locator tab 38. A wireless reader 68 such as an RFID reader is provided in the secure container 50 and is connected to a control system 70 of the secure container 50. A detector 72 such as a reed switch is also provided in the secure container 50, at a position close to the docking slot or ring 60 such that when the bag 10 is correctly located in the enclosure 56 with the locator tab 38 received in the docking slot or ring 60 the detectable component 66, (e.g. a magnet) can be detected by the detector 72 (e.g. a reed switch). The detector 72 is also connected to the control system 70 of the secure container 50.

**[0058]** When the bag 10 is correctly located in the enclosure 56 its wireless communication device 64 (e.g. an RFID tag) is detected by the reader 68 (e.g. an RFID reader) of the secure container 50. As is well known, RFID tags can be read at ranges of up to around 90 millimetres. Thus, where an RFID tag based system is used,

it is possible that the RFID reader 68 of the secure container 50 could detect the RFID tag 64 of the bag 10 if the bag was incorrectly located or installed in the enclosure 56 of the security container 50. The detectable component 66 of the bag 10, such as a magnet, provides a backup detection system to overcome this problem. Only when the locator tab 38 is correctly received in the docking slot or ring 60 will the detector (e.g. reed switch) 72 be activated by the detectable component 66 to indicate to the control system 70 that the bag 10 is correctly located in the secure container 50.

**[0059]** The combination of the detectable component 66 and the wireless communication device 64 in the locator tab 38 of the bag 10 makes it very difficult for a user to cause the control system 70 to falsely register that a bag 10 is in the correct position in the container 50. To further enhance this security aspect additional detectable components such as magnets and detectors such as reed switches may be provided at appropriate positions in the locator tab 38 and the secure container 50 respectively such that the control system 70 will only register that the bag is correctly located in the container 50 if the locator tab 38 is correctly positioned and oriented in the docking slot or ring 60.

**[0060]** The use of a wireless communication device 64, such as an RFID tag also facilitates tracking and auditing of bags 10 and secure containers 50, as each bag may be provided with a unique identifier which can be programmed into the wireless communication device 64 and can be detected by the reader 68 of the secure container 50, allowing the secure container 50 to keep a log of the bags 10 it has been used to carry and the location at which those bags 10 were placed in the secure container 10.

**[0061]** Additionally, the unique identifier may be transmitted by the secure container 50 to a management system at a location such as a cash depot or centre. For example, the secure container 50 may be provided with a cellular mobile communications module such as a GSM transmitter so that the unique identifier can be transmitted to the cash depot or centre as a text (SMS) message or a GPRS data signal.

**[0062]** Alternatively, the secure container 50 may transmit the unique identifier to a cash in transit vehicle in which the secure container 50 is being transported, for example using an infra-red link between the secure container 50 and a storage rack of the cash in transit vehicle. In this case, the vehicle is provided with a cellular mobile communications module such as a GSM transmitter, such that the vehicle is able to transmit the unique identifier to the cash depot or centre as a text (SMS) message or a GPRS data signal.

**[0063]** In a further alternative arrangement where the cash in transit vehicle does not have a cellular mobile communications module the secure container 50 may instead transmit the unique identifier to a storage rack in the cash depot or centre, for example by infra-red, at the end of a shift in which the secure container has been

used. The rack may be connected to a LAN (local area network) or WAN (wide area network) such that the unique identifier can be transmitted to the management system by the storage rack.

**[0064]** In an alternative embodiment of the secure bag 10 a tagging device such as a read-only memory (ROM) chip which is pre-programmed with the unique identifier may be used in place of the wireless communication device 64. In this embodiment the ROM chip may have a wired connection which uses a protocol such as 1-wire® to transfer data to the secure container 50. For example, the ROM chip may be connected to an electrical interface having two electrical contacts which may be positioned on the locator tab 38 of the secure bag 10. A complementary interface may be provided in the docking slot or ring 60 of the secure container 50 such that when the secure bag 10 is correctly positioned in the secure container 50 an electrical connection is formed between the complementary interfaces of the secure bag 10 and the secure container 50 to permit the ROM to be read by a ROM reader device of the secure container 50 to retrieve the unique identifier of the secure bag 10 for subsequent transmission to the management system, and to verify that the secure bag 10 is correctly positioned in the secure container 50. This embodiment has the advantage of lower power consumption than an RFID-based system. Additionally, as it relies on contact between the complementary interfaces of the secure bag 10 and the secure container 50 it fulfils the function performed by the detectable component 66 such as the magnet of the locator tab 38 and the complementary detector 72 such as the reed switch of confirming that the secure bag 10 has been correctly positioned in the secure container 50.

**[0065]** In a further alternative embodiment of the secure bag 10, a one- or two-dimensional barcode representing the unique identifier of the secure bag 10 secure bag may be provided on the locator tab 38. A barcode reader located in or close to the docking slot or ring 60 of the secure container 50 is able to read the barcode of the secure bag 10 when the secure bag 10 is correctly positioned in the secure container 50, to retrieve the unique identifier of the secure bag 10 for subsequent transmission to the management system, and to verify that the secure bag 10 is correctly positioned in the secure container 50.

**[0066]** The secure container 50 is provided with a security system which is operable to dispense a spoiling agent such as an ink, dye, adhesive or resin into the bag 10 in the event of an attack such as theft, attempted theft or unauthorised attempts to open the secure container 50. The spoiling agent may also include a unique identifier such as DNA which may be used to identify bank notes or similar items following a theft.

**[0067]** The security system includes one or more sensors 80 which are configured to detect an attack on the secure container 50, such as an unauthorised attempt to open the secure container 50. The sensors 80 may include, for example, motion detectors, acceleration de-

tectors, position or location sensors, electrical sensors for detecting attempts to cut through the walls, base or lid of the secure container 50, or any other type of sensor or detector.

**[0068]** On detection of an attack on or attempted theft of the secure container 50 the sensor(s) 80 transmit a signal to the control system 70 of the secure container 50, which activates a spoiling system of the secure container 50 to cause the spoiling agent to be dispensed into the bag 10, as is described below.

**[0069]** As shown in Figures 1 and 3, the spoiling system of the secure container 50 includes a dispenser 64 which is mounted for movement between an inactive position as shown in Figure 1 and an active position as shown in Figure 3. In the example illustrated in Figures 1 and 3 a single dispenser 64 is provided, but it will be appreciated that two or more dispensers 64 may be employed. The dispenser 64 is a hollow tube with an outlet 66 provided at an outer end. An inlet 68 at an opposite end communicates with a reservoir of a spoiling agent such as ink, dye, adhesive or resin.

**[0070]** The secure container 50 includes a dispensing system which receives a signal from the control system 70 of the secure container when an attack on the secure container 50 is detected, which control signal causes the dispensing system to activate. When the dispensing system is activated the dispenser 64 extends from the inactive position shown in Figure 1 to the active position of Figure 3, in which the dispenser 64 enters the valve assembly 24 of the bag 10, causing the one way valve 30 to open, allowing the dispenser to enter the interior of the bag 10. Once the dispenser has entered the bag 10 the spoiling system causes the spoiling agent to be dispensed, through the outlet 66 of the dispenser 64, onto the contents of the bag 10.

**[0071]** When all of the spoiling agent has been dispensed, the dispenser 64 may retract to its inactive position, causing the one way valve 30 to close, thus preventing the spoiling agent from escaping from the bag 10.

**[0072]** The dispensing system of the secure container may operate in a variety of ways. One example of a suitable dispensing system, which is shown and described in the applicant's European patent no. EP1499787B1, includes a container of pressurised gas such as carbon dioxide having a sealed outlet which communicates with the reservoir of spoiling agent. The reservoir in turn communicates with dispensing means including a fixed first part having an inlet at one end for receiving the spoiling agent and an open opposite end. The moveable dispenser 64 is slideably mounted on the fixed first part, closing the open end thereof. The moveable dispenser 64 in this exemplary dispensing system has its inlet 68 at a rear portion thereof and its outlet 66 at a front portion. On detection of an attack on the secure container 50 the control system sends an electrical signal to the dispensing system which in turn triggers an explosive protractor or similar device mounted on or adjacent the seal of the container of compressed gas. The seal is thus breached,

allowing the compressed gas to enter the reservoir of spoiling agent, compressing the spoiling agent and forcing it into the first part of the dispensing means. As the pressurised spoiling agent fills the fixed first part of the dispensing means, it acts on the moveable dispenser 64, causing it to move outwardly, towards the valve assembly 24 of the bag 10. When the moveable dispenser 64 has reached the maximum extent of its movement, its inlet 68 communicates with the open end of the fixed first part of the dispensing means, allowing the pressurised spoiling agent to flow through the moveable dispenser 64 and out of the outlet 66. At this point the outlet 66 of the moveable dispenser 64 is positioned inside the bag 10, and thus the spoiling agent is dispensed into the interior of the bag 10.

**[0073]** The moveable dispenser 64 may be biased by means of a spring or other biasing means towards its inactive position, such that when all of the spoiling agent has been dispensed and thus there is no pressure acting against the biasing means the moveable dispenser 64 retracts towards its inactive position.

**[0074]** Referring now to Figure 6, an alternative embodiment of a secure bag is illustrated generally at 100. The secure bag 100 shares many of the features of the secure bag 10 illustrated in Figures 1 to 3. For consistency the reference numerals used in Figures 1 to 3 are used in Figure 6 to denote the features common to the embodiments of Figures 1 to 3 and 6.

**[0075]** The secure bag 100 is similar to the secure bag 10 with the exception that the valve assembly 24 is omitted. In its place is a diaphragm 102 of a resilient material such as rubber or the like, which seals the aperture 36 of the secure bag 100.

**[0076]** On activation of the dispensing system, the dispenser 64 extends from its inactive position, as shown in Figure 1, to its active position. As the dispenser 64 moves from its inactive position to its active position it pierces the diaphragm 102, creating a hole through which the dispenser 64 is able to enter the interior of the bag 100. Once the dispenser 64 has entered the bag 100 the spoiling system causes the spoiling agent to be dispensed, through the outlet 66 of the dispenser 64, onto the contents of the bag 100.

**[0077]** When all of the spoiling agent has been dispensed, the dispenser 64 may retract to its inactive position. The hole in the diaphragm 102 may then close or partially close to prevent or impede the spoiling agent from escaping from the secure bag 100.

**[0078]** As is shown in Figure 7, the diaphragm 102 may be provided with one or more zones of weakness 104 to facilitate piercing of the diaphragm 102 by the dispenser 64. The zones of weakness 104 may be, for example, zones where the material of the diaphragm 102 is thinner than elsewhere to promote tearing of the diaphragm 102 at those zones 104.

**[0079]** It will be appreciated by those skilled in the art that there are a wide variety of ways in which the dispensing system can operate. For example, a solenoid

may be provided to cause the moveable dispenser 64 to extend on activation of the dispensing system, with the spoiling agent being pressurised by an electrically or mechanically operated piston to force it out of the reservoir, through the moveable dispenser 64 and out of the outlet 66.

**[0080]** It will be appreciated from the foregoing that the secure bag and the complementary secure container of the present invention provide an improved system for protecting valuable items such as bank notes in transit or storage, by providing a system which controllably, evenly and reliably spoils the contents of the secure bag in the event of an attack on the secure container. Additionally, if the secure bag 10 has reusable closing means then, provided that the spoiling system has not been activated, the secure bag of the present invention can be re-used, which helps to reduce the cost and negative environmental impact of cash in transit operations in comparison to known systems in which note bags are damaged or destroyed in the course of transporting their contents.

**[0081]** Before going on to set out the claims, we shall first provide a set of clauses describing embodiments of the invention.

#### 1. A secure bag comprising:

first and second opposed body panels that are attached to each other along opposed sides thereof, the first and second opposed body panels being connected to each other at one end thereof to form a closed end of the secure bag; a mouth formed at the end of the first and second body panels opposed to the closed end; closing means for closing the mouth; and a locating tab for correctly locating the bag in a secure container.

2. A secure bag according to clause 1, wherein the locating tab comprises a wireless communication device.

3. A secure bag according to clause 2 wherein the wireless communication device comprises an RFID tag.

4. A secure bag according to any one of clauses 1 to 3 wherein the locating tab comprises a detectable component.

5. A secure bag according to clause 4 wherein the detectable component comprises magnet means.

6. A secure bag as claimed in any one of the preceding clauses, further comprising seal means for permitting introduction of fluid into the secure bag.

7. A secure bag according to clause 6 wherein the

seal means comprises a valve.

8. A secure bag according to clause 7 wherein the valve is a one way valve.

9. A secure bag according to clause 8 wherein the one way valve comprises a swing type wafer check valve.

10. A secure bag according to clause 8 or clause 9 wherein the one way valve is biased towards a closed position.

11. A secure bag according to clause 6 wherein the seal means comprises a diaphragm.

12. A secure bag according to clause 11 wherein the diaphragm is provided with a zone of weakness.

13. A secure bag according to any one of the preceding clauses wherein the closing means is reusable.

14. A secure bag according to any of the preceding clauses further comprising sealing means for sealing the bag closed.

15. A secure bag according to clause 14 wherein the sealing means or the closing means is tamper-evident.

16. A secure bag according to any one of the preceding clauses further comprising means for storing a unique identifier of the secure bag.

17. A secure bag according to clause 16 wherein the means for storing the unique identifier comprises a read-only memory

18. A secure bag according to clause 17 wherein the locating tab comprises an interface for connecting to a device for reading the read-only memory.

19. A secure bag according to clause 16 wherein the means for storing the unique identifier comprises a barcode.

20. A secure container for storing or transporting a secure bag, the secure container comprising a dispensing system for dispensing a spoiling agent into an interior of the secure bag, and docking means for receiving a locating tab of the secure bag such that the secure bag is correctly located in the secure container.

21. A secure container according to clause 20, wherein the dispensing system comprises a dispenser that is moveable between an inactive position

in which the dispenser is located outside of the secure bag and an active position in which the dispenser is located in an interior of the secure bag.

22. A secure container according to clause 20 or 21 further comprising means for reading a unique identifier of the secure bag.

23. A secure container according to clause 22 wherein the means for reading the unique identifier comprises an interface and a device for reading a read-only memory of the secure bag.

24. A secure container according to clause 22 wherein the means for reading the unique identifier comprises a barcode reader.

25. A secure container according to clause 22 wherein the means for reading the unique identifier comprises a wireless receiver for reading a wireless device of the secure bag.

26. A secure container according to clause 25 wherein the wireless receiver comprises an RFID reader for reading an RFID tag of the secure bag.

27. A secure container according to any one of clauses 20 to 26 further comprising detector means for detecting a detectable component of the secure bag.

28. A secure container according to clause 27 wherein the detector means comprises magnetic detector means for detecting magnet means of the secure bag.

29. A secure container according to any one of clauses 20 to 28 wherein the spoiling agent comprises ink, dye, adhesive or resin.

30. A secure container according to any one of clauses 20 to 29 wherein the spoiling agent comprises a unique marker.

31. A secure container according to clause 30 wherein the unique marker comprises DNA.

32. A secure container according to any one of clauses 20 to 31 further comprising wireless communication means for communicating with a remote management system.

33. A secure container according to any one of clauses 20 to 32 further comprising communication means for communicating with a storage rack or vehicle in which the secure container may be received.

34. A system for storing or transporting valuable items, the system comprising a secure bag accord-



ing to any one of clauses 1 to 19 for receiving a valuable item and a secure container according to any one of clauses 20 to 33 for receiving the secure bag.

## Claims

### 1. A secure bag comprising:

first and second opposed body panels that are attached to each other along opposed sides thereof, the first and second opposed body panels being connected to each other at one end thereof to form a closed end of the secure bag; a mouth formed at the end of the first and second body panels opposed to the closed end; closing means for closing the mouth; and a locating tab for correctly locating the bag in a secure container.

2. A secure bag according to claim 1, wherein the locating tab comprises a wireless communication device.

3. A secure bag according to claim 2 wherein the wireless communication device comprises an RFID tag.

4. A secure bag according to any one of claims 1 to 3 wherein the locating tab comprises a detectable component.

5. A secure bag according to claim 4 wherein the detectable component comprises magnet means.

6. A secure bag as claimed in any one of the preceding claims, further comprising seal means for permitting introduction of fluid into the secure bag.

7. A secure bag according to claim 6 wherein the seal means comprises a valve or a diaphragm.

8. A secure bag according to any one of the preceding claims further comprising means for storing a unique identifier of the secure bag.

9. A secure bag according to claim 8 wherein the means for storing the unique identifier comprises a read-only memory

10. A secure bag according to claim 9 wherein the locating tab comprises an interface for connecting to a device for reading the read-only memory.

11. A secure container for storing or transporting a secure bag, the secure container comprising a dispensing system for dispensing a spoiling agent into an interior of the secure bag, and docking means for receiving a locating tab of the secure bag such that

the secure bag is correctly located in the secure container.

12. A secure container according to claim 11, wherein the dispensing system comprises a dispenser that is moveable between an inactive position in which the dispenser is located outside of the secure bag and an active position in which the dispenser is located in an interior of the secure bag.

13. A secure container according to claim 11 or 12 further comprising means for reading a unique identifier of the secure bag.

14. A secure container according to claim 13 wherein the means for reading the unique identifier comprises a wireless receiver for reading a wireless device of the secure bag.

15. A secure container according to claim 14 wherein the wireless receiver comprises an RFID reader for reading an RFID tag of the secure bag.

16. A system for storing or transporting valuable items, the system comprising a secure bag according to any one of claims 1 to 10 for receiving a valuable item and a secure container according to any one of claims 11 to 15 for receiving the secure bag.

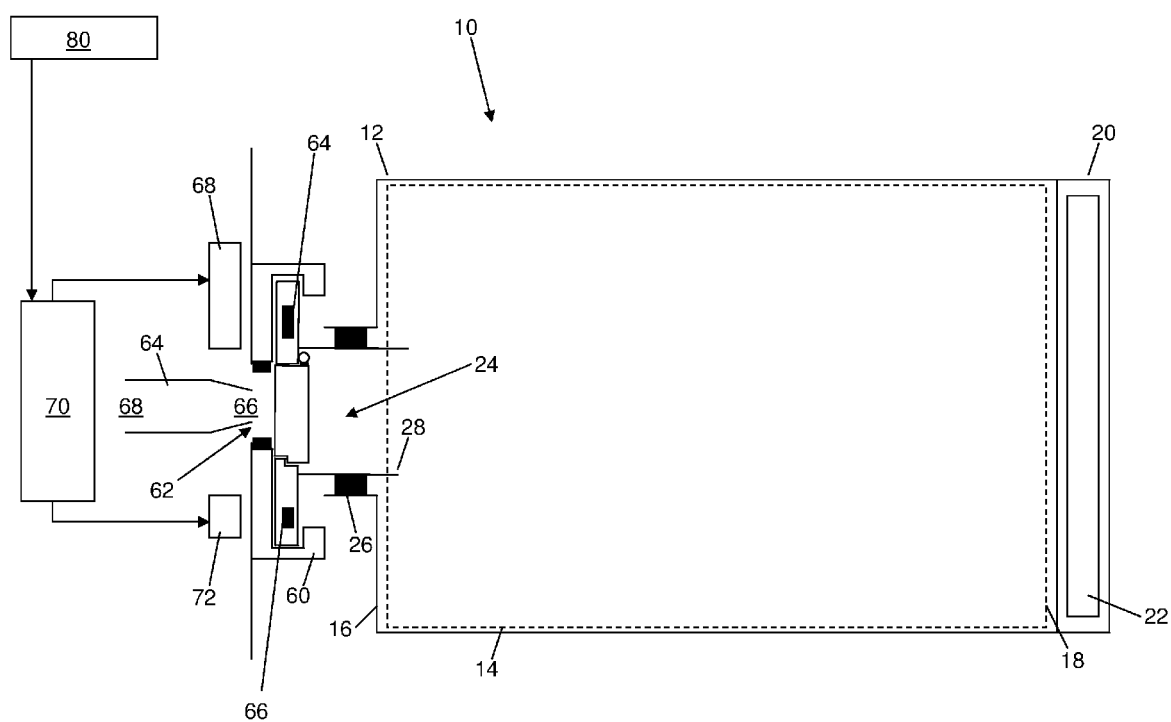


Figure 1

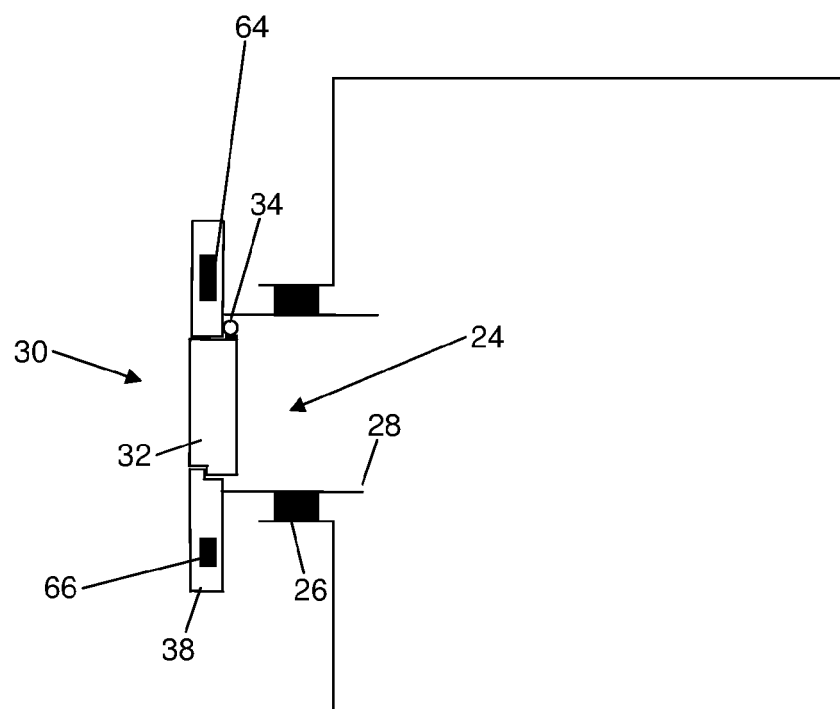


Figure 2

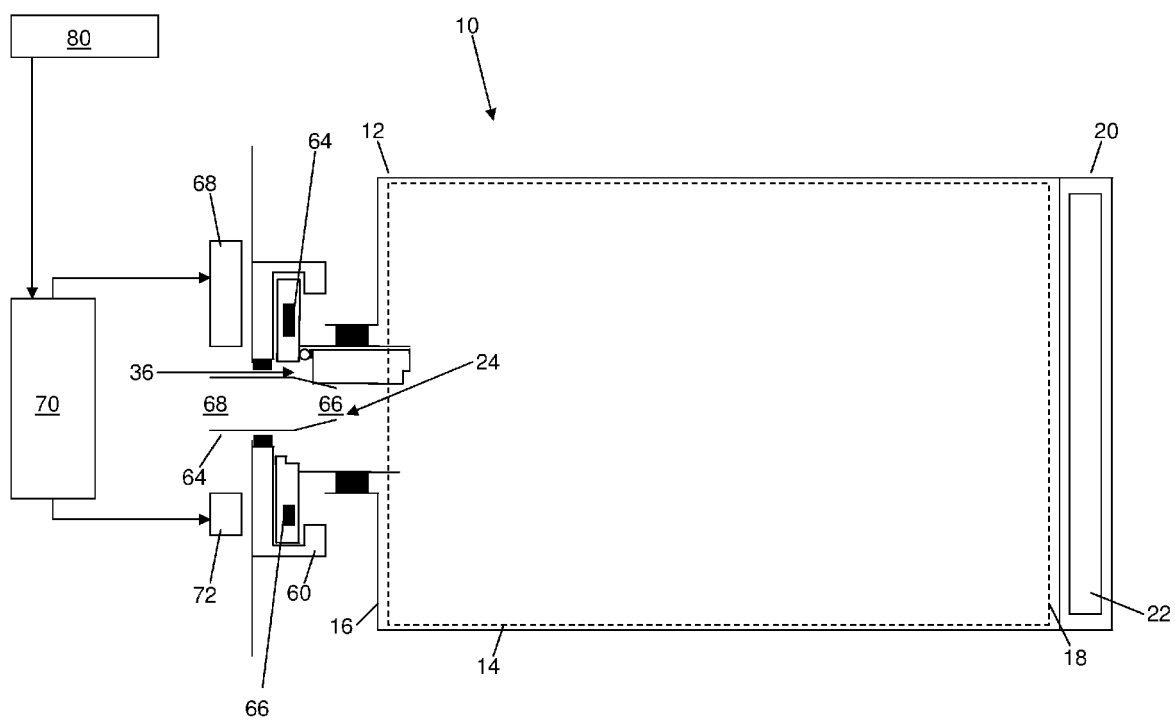


Figure 3

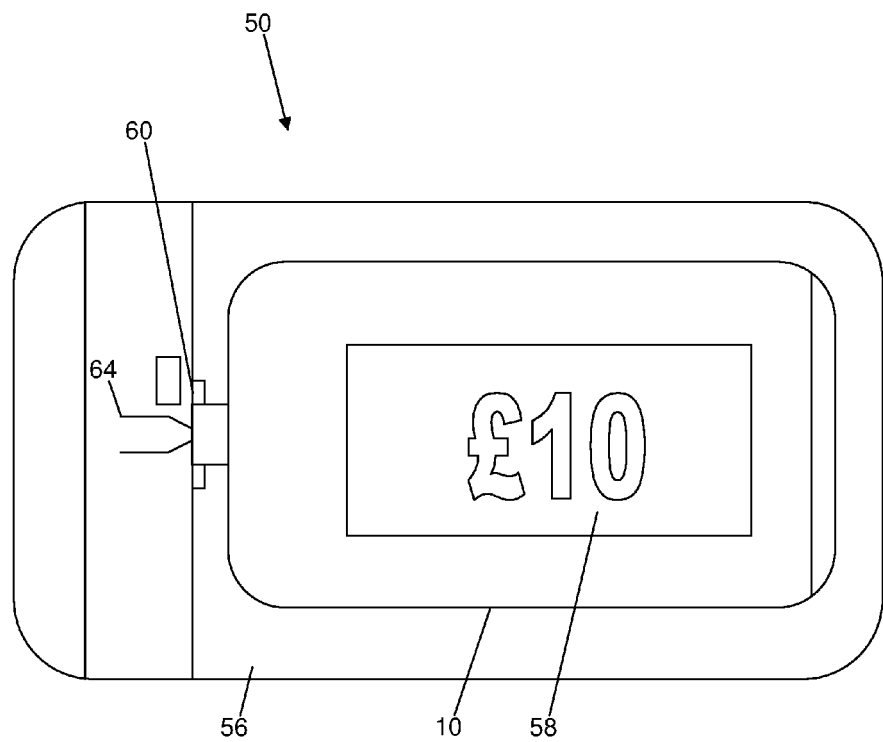


Figure 4

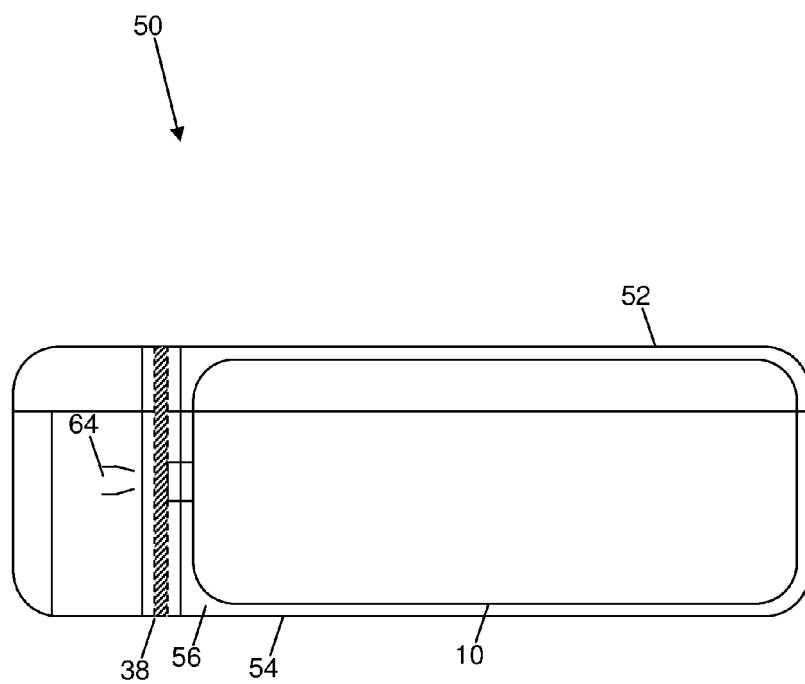


Figure 5

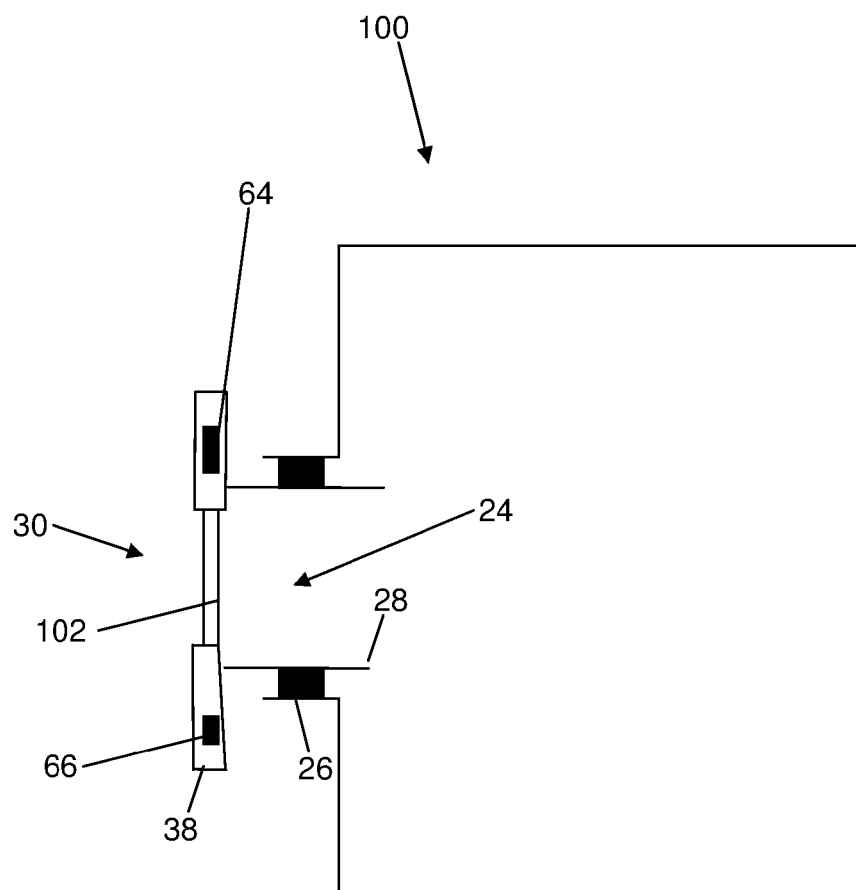


Figure 6

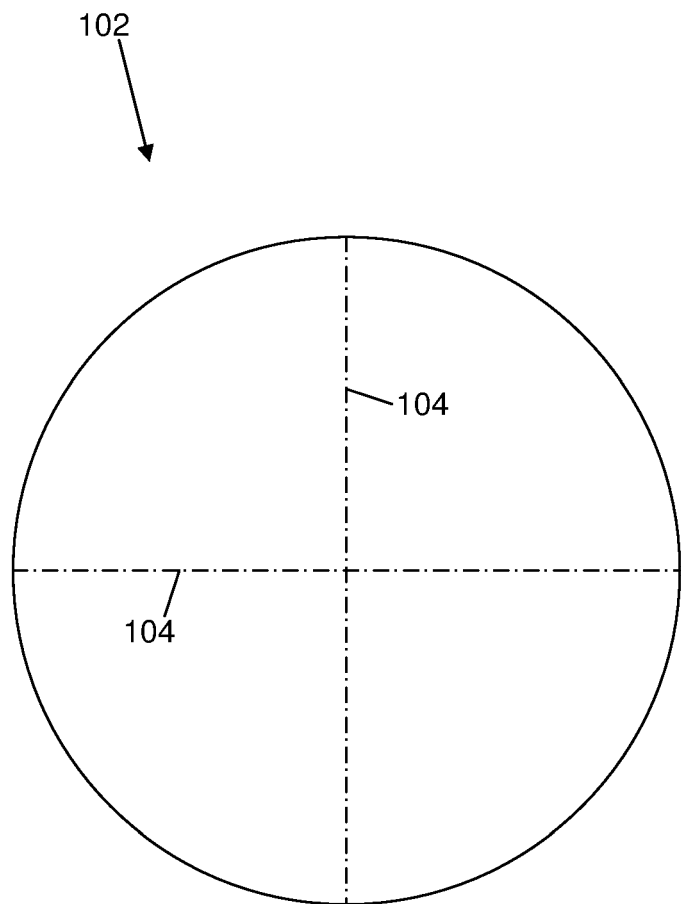


Figure 7





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Application Number  
EP 12 16 0892

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A	* page 2, line 22 - line 42 * * page 3, line 7 - line 23 *	2-10, 13-16	
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 May 2012	Examiner Lindholm, Anna-Maria
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)



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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 May 2012	Examiner Lindholm, Anna-Maria
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