An electronic tag comprising an electronic circuit adapted to transmit readable identifier information to an interrogation device and a shielding means movable between a first position in which communication with the interrogation device is inhibited and second position in which communication with the interrogation device is permitted. The invention also relates to a system of remote monitoring of articles by means of the electronic tag and a kit of parts thereof.
DESCRIPTION

ELECTRONIC TAG

The present invention relates to electronic tags and in particular, but not exclusively, to tags which can be used to assess the status of an article, such as a parts bin used in the automotive or aerospace industries (for example as disclosed in GB2327668).

Electronic tags are used for a wide range of applications, such as the tracking of goods, the integrity of containers etc. One major drawback of one type of wireless electronic tags is the requirement for a constant energy supply so that the tag can communicate with other tags and/or a base station. As will be apparent, the transmission of data requires a considerable amount of energy and in order to reduce power consumption, tags are often designed to turn themselves on only when in use. Furthermore, the tags are frequently programmed after purchase with a customer-defined data, such as a reference number, in addition to other data that is often superfluous for the tag’s operation, which requires additional memory and power to transmit the additional data.

Recent developments in the field of electronic tags have resulted in un-powered passive radio frequency identification (RFID) tags. These tags do not contain a battery, but are powered by a base station or tag reader which produces an energising field that energises the antenna of the tag so as to provide energy to power a transmission of data from the tag. However, these tags are only used to
track the whereabouts of goods in a defined area, or as a security tag that activates an alarm in a shop. Due to their passive nature, they are unsuitable for relaying information to a tag reader or a base station regarding the status of an article, such as whether or not a seal has been broken or a parts bin door has been opened.

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It is therefore an object of the present invention to provide an electronic tag that is passive, but which can also provide information regarding the status of an article. Furthermore, it is also an object of the present invention to provide for system/method of checking and analysing the status of an article and conveying information as to whether any action need be taken as a consequence of the status.

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In accordance with the present invention, there is provided an electronic tag comprising an electronic circuit adapted to transmit readable identifier information to an interrogation device and a shielding means movable between a first position in which communication with the interrogation device is inhibited and second position in which communication with the interrogation device is permitted.

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The present invention therefore provides an electronic tag that can convey the status of an article by simply shielding a circuit from an interrogation device that can in turn interpret the presence or absence of the identifier information as the status of an article. The circuit need not need contain data other than the identifier information and does not need require its own power supply.
The shielding means may simply be a strip of material that can cover the antenna (if provided) of the circuit and therefore prevent the interrogation device from reading the identifier information contained on the circuit. For example, the shielding means may be constructed using a metallic material. Alternatively, the shielding means may comprise a means that interferes with the circuit or indeed breaks the circuit. Preferably, the circuit is a passive RFID circuit connected to an antenna. Therefore, the circuit may be a passive RFID tag as currently available and used in applications such as security tags for goods in shops etc. The passive RFID circuit may be powered by its antenna being energised by an energising field on a interrogation device and such circuits will be known to the skilled addressee. The circuit will preferably contain a micro-chip and may further be programmable and/or capable of storing data and transmitting the data when required to the interrogation device. Should it be required, the data held on the micro-chip may be encrypted so that only an authorised interrogation device can transmit and receive data.

Preferably, the electronic tag is wireless and uses radio waves for communication between itself and the interrogation device. The preferred radio frequency is UHF for transmitting and receiving data (such as status information) from the interrogation device. The interrogation device may also write information to the electronic tag if required.
It is also preferred that the tag comprises two or more electronic circuits adapted to transmit readable identifier information to the interrogation device. An electronic circuit may contain different identifier information, although it is also be envisaged that the present invention may utilise a number of electronic circuits having the same identifier information, but different status information. The identifier information will also preferably be a unique Identification code (ID) and such a code may be randomly generated.

When the shielding means is in the first position, communication between a first of the circuits and the interrogation device may be permitted and communication between the second of the circuits and the interrogation device may be inhibited. Furthermore, when the shielding means is in the second position, communication between the second of the circuits and the interrogation device may be permitted and communication between the first of the circuits and the interrogation device may be inhibited.

The article may also comprises a parts bin and/or a stack of parts bins. Such parts bins are commonly used in the aerospace and automotive industries and in particular those manufactured by Hurst Green Plastics Limited in the U.K (for example as shown in GB2327668). In order to ensure the steady supply of parts during the assembling process, the parts bin may comprise a loading chamber and a dispensing chamber separated by a gate having an electronic circuit disposed thereon, the actuation of the gate allowing goods being held in the loading chamber to fall into the dispensing chamber. As both chambers are constructed of
a clear plastics material, stock control personnel can see when stock needs to be replenished however; it is more efficient if the stock is monitored electronically so that automatic ordering can take place etc. The actuation of the gate may deploy or re-deploy the shielding means to shield one or more circuits. Prior to the actuation of the gate, the shielding means may be shielding a first circuit and after actuation, it may be re-deployed to shield the second circuit. The shielding means may be deployable by means of a spring loaded hinge whose leaves can move between a position shielding the first circuit to a position shielding the second circuit. Alternatively, the shielding means may be deployable by means of a spring loaded gate that can move between a position shielding the first circuit to a position shielding the second circuit.

The electronic tag may also have a printed barcode adhered to a circuit and/or the tag and preferably, the tag is adapted to be received on the article. The tag may also have an adhesive strip for use in attaching it to the article. Alternatively, or additionally, the tag may be integrally formed with the article during construction.

In accordance with a further aspect of the present invention, there is provided a system for assessing the status of an article, wherein the article has an electronic tag as herein above described and the shielding means is mounted on part of the article which is movable between a first position corresponding to the first position of the shielding means and a second position corresponding to a second position of the shielding means.
The system may provide for the interrogation device to be brought into close proximity to the tag so that identifier information of an un-shielded circuit can be read. Alternatively, the interrogation device may be static and continually attempt to interrogate the circuits of a tag(s) on one or multiple articles. Indeed, articles may pass the interrogation device and this may be appropriate when the status of multiple articles are being assessed as they are being moved past the interrogation device(s) throughout a warehouse for example. The interrogation device may be capable of reading multiple circuits and may read in the region of up to 200 circuits per second.

The proximity of the interrogation device relative to the tag will largely be determined in part to the distance required for successful communication, but in the instance where the tag utilises passive RFID circuits, will likely require the interrogation device to be within a 10 meter distance so that the circuits can be successful energised if un-shielded. The interrogation device may be controlled by a central processing unit, such as a computer and the identifier information from each circuit is will preferably be held on a database in the central processing unit. Therefore, the central processing unit can determine the status of a given article by comparing which circuit in the tag is shielded and which circuit on the tag is un-shielded.

The system may comprise a first and a second electronic circuit and whereby the shielding means is deployed over the first electronic circuit and when the status of the article changes, the shielding means is re-deployed over the second electronic
circuit. Both circuits may have unique identifiers and both identifiers may be being linked in the database to a specific article in a subset of many. Visibility (to the interrogation device) of only the first unique identifier may designate that the status of the article is “full”, whereas the visibility of only the second unique identifier may designate that the article is “empty” and need replenishing. The database will therefore be able to determine the status of an article based upon which circuits are visible at a given point in time and the status can be logged accordingly.

The circuit used in the method will preferably be a passive RFID circuit connected to an antenna and will therefore be powered by its antenna being energised by an energising field on a interrogation device. Therefore, the tag does not require a battery for power. The re-deployment of the shielding means may be automatic when the status of the article changes. Alternatively, the re-deployment may be manual.

The identifier information in the method may be a unique ID code that is different on each electronic circuit. Furthermore, the interrogation device will preferably be able to determine the status of the article by assessing which electronic circuit is screened and which is not. The interrogation device may also be linked to a database which can be interrogated so as to determine the status of the article.

It will be apparent to the skilled addressee that the tag may be used for a number of applications, such as tracking and assessing the status of a number of articles,
such as packages and articles of clothing, large components, assembly jigs, mobile containers, stations on moving containers to name a few. For example, the tag may be used to track a parcel through various depots, whereby the tag has many circuits and each depot removes a sticker that is shielding a single circuit and each reader at a check point can determine the progress/status of the parcel before it is delivered.

In yet another aspect of the present invention, there is provided a kit of parts for the production of an electronic tag capable of conveying the status of an article to an interrogation device, the kit comprising one or more programmable passive electronic circuits capable of containing readable identifier information, a shielding means capable of shielding at least one circuit from the interrogation device, and an energising interrogation device capable of communicating with the programmable.

The kit may be used to produce an electronic tag as herein above described and may also incorporate any feature thereof.

It will be apparent to one skilled in the art that tag can be retro fitted to a given article or even adapted or designed to be used in conjunction with an existing article.
Specific embodiments of the present invention will now be more particularly described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a parts bin, which incorporates an embodiment of the electronic tag according to the present invention;

Figures 2A and 2B, are perspective views which show a method of deploying a shielding means of the electronic tag of the present invention in the parts bin of Fig. 1;

Figures 3A and 3B, are perspective views of a method of deploying a shielding means of a similar configuration to that shown in Figures 2A and 2B, which incorporates an alternative configuration of electronic circuits in the electronic tag according to the present invention;

Figure 4 is a perspective view of a parts bin of a similar configuration to that shown in Figure 1, which incorporates an alternative embodiment of deploying the electronic tag according to the present invention;

Figures 5A and 5B, is a perspective view of the alternative method (than that shown in Figures 2A – 3B) of deploying the shielding means of the electronic tag as shown in Figure 3; and
Figures 6A and 6B, are perspective views of a method of deploying a shielding means of a similar configuration to that shown in Figures 5A and 5B, which incorporates an alternative configuration of electronic circuits in the electronic tag according to the present invention;

With reference to Figure 1, there is provided a parts bin 2 that is similar to those found in assembly and repair centres for the aerospace and automotive industries of the type described in GB2327668. The bin 2 has two transparent doors, one of which is located above the other and the doors form a loading chamber 4 and a dispensing chamber 6. Each door is pivotable downwardly so as to allow access and the chambers are separated by means of a slidably mounted planar gate 8 which when pulled horizontally away from the bin, in the direction indicated by arrow 10, results in the contents of the upper loading chamber 4 falling into the lower dispensing chamber 6. The door of each of the upper loading chamber 4 and the lower dispensing chamber 6 is provided with a handle 12, 14 respectively, to facilitate opening. The bin 2 also has an electronic tag 16 attached to the housing in a central portion 15 between the doors of the loading chamber 4 and the dispensing chamber 6, immediately above the gate 8. The electronic tag 16 is engageable with the surface of the gate 8 to allow it to indicate when the gate 8 is moved from its original position, as will be explained. The tag remains in a “closed” position when the gate 8 is shut, as a result of abutment with an upstanding lug 20 located on the upper surface of the gate. However, when the gate 8 is opened, the lug 20 is disengaged from the tag 16 and the tag automatically moves to an “open” position.
As shown in Figures 2A and 2B, the electronic tag 16 has two generally rectangular elongate flaps 55, 57 which are hinged together along one edge along a hinge axis 52. The wings are spring-biased by an internal spring 53 (shown schematically) towards the position shown in Figure 2B in which the two flaps 55, 57 are pivoted away from each other.

The tag has two passive RFID electronic circuits 54, 56, each of which is programmed with unique identifier information. The first electronic circuit 54 is located on the outer face of the first flap 55 and the second electronic circuit 56 is located on the inner face of second flap 57, each having an antenna 58, 60 in the form of broken figure of eight, which is able to not only transmit data to a reading device (not shown) but also to receive RF energy from a reading device (not shown) in order to activate the circuits 54, 56. Each electronic circuit is also associated with a barcode 62, 64 (that will in turn correspond to the unique identifier) respectively and a thin metal plate 66 is secured to the underside of the first flap 55 and is therefore located between both circuits 54,56.

As a consequence, only one circuit 54,56 is presented to the reading device when the tag is in either the closed position or the open position, and the other circuit is electromagnetically shielded from the reader by means of the metal plate 66. Therefore an electronic circuit reader can interpret whether or not the tag is in the open position or closed position depending upon the identity of the electronic
circuit 54,56 from which a signal is detected, and such positions can be assigned to a status of the gate 8 in the bin, as to whether or not it has been activated.

In operation, the electronic tag 16,50 is secured in place in the central portion 15 of the parts bin 2 in the spring loaded bias position shown in Figure 2A, as the lug 20 on the gate 8 holds the two flaps 55,57 together. In this position, the first electronic circuit 54 on the outer face of flap 55 can communicate with a reading device (not shown), whereas the second electronic circuit 56 is shielded electronically by the twin metal layer 66 and therefore is unable to communicate with the reader. As each electronic circuit has a unique identifier, the reading device can establish whether or not the electronic tag is in either the position shown in Figure 2A or that of 2B, the latter of which indicating that the gate 8 has been moved.

When the gate 8 has been moved outwardly in the direction 10, then the lug 20 on the gate 8 allows the spring loaded bias 53 to lift the first flap 55 away from the second flap 57 and the position shown in Figure 2B is assumed. In doing so, the second electronic circuit 56 is exposed and is no longer covered by the thin metal plate 66. The second electronic circuit 56 can therefore communicate with the reading device, whereas the first electronic circuit is shielded electromagnetically by the plate 66. The first flap 55 then remains apart from the second flap 57, until the electronic tag is reset by pushing the first flap 55 towards the second flap 57 against the biasing of the biasing spring 53 and sliding the gate 8 to a closed position, whereby the lug 20 holds the first and second flaps 55,57 together.
Figures 3A and 3B show an alternative embodiment (to that shown in Figures 2A and 2B) of an electronic tag which can be used in conjunction with the parts bin shown in Figure 1. The electronic tag shown in Figures 3A and 3B operates in a similar manner to that shown in Figures 2A and 2B and similar features are denoted with the corresponding reference number prime. However, the electronic tag in this embodiment only contains a single electronic circuit 56' and depending upon whether or not the single circuit is shielded, the reading device can ascertain whether the flap 55' is in the closed position (shown in Figure 3A) or in the open position (shown in Figure 3B), by being able to communicate or not communicate with the electronic circuit.

A second embodiment of the present invention is illustrated in Figs. 4, 5 and 6, and comprises a parts bin 2' having similar features to those shown in the parts bin shown in Figure 1. All the features which are similar in Figure 4 to those shown in Figures 1 have the same reference numeral, although are denoted with the number prime. Figure 4 shows an electronic tag 100 (shown in more detail in Figures 5A, 5B and 6A, 6B) located at the central portion 15' between the upper and lower chamber 4',6'. On the gate 8' there are two locking members 101, each having a locking pin 108 capable of determining the condition of the tag, as will be explained.

As shown in more detail in Figures 5A ad 5B, the tag 100 has an elongated housing 102, in the form of an elongated rectangular, planar rear wall 102a, two
short parallel side walls 102b each extending perpendicularly from a respective end of the rear wall, two opposed parallel coplanar, inwardly directed retaining walls 102c, each extending inwardly from the end of a respective side wall, and two retaining lips 102d, each extending along an outer edge of a respective retaining wall and projecting towards the rear wall 102a. The housing 102 defines two recesses 104 between the retaining walls 102c and the rear wall 102a, which receive the end of a flat bar 106 which is slidable along the recesses 104 in the housing 102 between a lowered position in which the bar is withdrawn below the level of the upper edge of the rear wall 102a (as shown in Figure 4A) and a raised position in which the upper edge of the bar is level with the upper edge of the rear wall 102a (as shown in Figure 5B). The bar 106 is formed from a plastics sheet, but the rear face is covered with a thin metal plate or sheet 110 which acts as a radio frequency (electromagnetic) shield. Alternatively, the bar 106 may be formed from metal, in which case the metal plate 110 on the rear face can be omitted.

The housing is provided with a first electronic circuit 112 and a second electronic circuit 114, each located on the front face of the rear wall 102a, one above the other, each of which is either shielded or exposed, depending upon whether the bar 106 is in the raised or lowered position. The electronic circuits are passive RFID tags that are pre-programmed with unique identifier information and have the same operation as those shown in Figures 2A, 2B and 3B.
The principle of the electronic tag works in a similar manner to that as described in Figures 1-3B in that a reading device can assess whether or not the gate 8 has been opened based upon which one of the two circuits 112, 114 provided is exposed. In use, when the gate 8 is closed, then the locking pins 108 on the locking members 101 and the gate 8 are received in apertures 114 and also pass into aligned apertures 116 in the ends of the bar 106, when the bar is in the lowered position (as shown in Figure 4A). The ends of the housing 102 also incorporate two biasing springs 103, one at each end, which bias the bar 106 upwards. The locking pins 108 are located on locking members 101 that are in turn attached on the gate 8' of the parts bin so that when the gate 8' is in a closed position (as shown in Figure 5A), the first circuit 112 is exposed and the second circuit shielded, but when the gate 8' is opened, the latch is moved away from the tag and in doing so disengages the pins 108 from the apertures 116 and the biasing springs 103 raise the bar 106 automatically to expose second circuit 114 and shield the first circuit 112. The bar 106 may also accommodate a bar code or description of the goods contained in the parts bin if required.

Figures 6A and 6B show an alternative embodiment (to that shown in Figures 5A and 5B) of an electronic tag which can be used in conjunction with the parts bin shown in Figure 4. The electronic tag shown in Figures 6A and 6B operates in a similar manner to that shown in Figures 5A and 5B and similar features are denoted with the corresponding reference number prime. However, the electronic tag in this embodiment only contains a single electronic circuit 114' and depending upon whether or not the single circuit is shielded, the reading device
can ascertain whether the bar 106' is in the lowered position (shown in Figure 6A) or in the raised position (shown in Figure 6B), by being able to communicate or not communicate with the electronic circuit.

The reading device (not shown) can perform a number of functions, such as reading the identifier information on non-shielded circuit in addition to re-programming the exposed circuit with new identifier information. The reading device also powers the transmission to and from the circuits as it energises the antennae on the circuits and therefore provides the circuits with power. The reading device will be connected to a computer, such as a personal digital assistant (PDA) palm top computer so that the status of the containers can be ascertained and either the data collected relayed immediately to a central computer for interrogation and input into computer, or uploaded for the same purpose at a later time. The use of a PDA, allows a store keeper to simply walk past the rows of parts bins (preferably at a distance of about 6 metres of less) with the reading device so as to get a real-time assessment of each parts bin. Alternatively, a static single (or multiple) reading device can continually poll the circuits so as to ascertain the status of the parts bins on a continuous basis.

It is therefore apparent that the status of a parts bin can be easily ascertained by means of whether or not a first circuit or a second circuit is visible (not shielded) to the reading device and therefore whether or not a gate 8, 8' has been actuated. If the drawer has been actuated, then this can be flagged to the store keeper to order more parts, or alternatively, the parts automatically re-ordered. When the
store keeper replenishes the parts, he/she will reset the tag so that the shield is deployed in a "closed" position and therefore the reader establishes that the parts bin is full and does not need to be replenished as the first circuit will be visible and the second circuit will be shielded.

Alternatively, if a single electronic circuit is used in the construction of the electronic tag (as shown in Figures 3A, 3B, 6A and 6B), then the status of a parts bin can still be easily ascertained by means of whether or not the single electronic circuit is visible to the reading device. As if the gate 8,8’ has not been actuated, then the electronic circuit is shielded and not visible and the reading device assumes that the gate has not been actuated. However, should the single circuit be visible to the reading device, then the reading device can assume that the gate 8,8’ has been actuated and this flagged to the store keeper.

Of course, the electronic tag need not be limited to having just one or two electronic circuits, but may have multiple circuits and the shield can be adapted to cover different circuits at different times and may also have multiple shields if required. Therefore an article having more than two statuses can be accommodated.

The software system used in association with the present invention will have the following function requirement specifications so as to effectively monitor, analyse and support the use of the electronic tag, for example:

a) Supporting transactions from the unit (RFID or bar code based):
- Status logging - Reserve chamber Empty or Full, Both chambers empty
- Replenishment of Reserve chamber
- Change of Bin content (product/part)
- Location of Bin and Change of Location

b) Displaying graphically and in text:
- Bin/Part layout (Panel configuration)
- Status of Bin, distinguishing between ‘Newly Empty’ and ‘Still Empty’
- Theoretical stock (given time of last empty of reserve chamber)
- Usage Time of last batch, average last 5 and last 20 batches
- Replenishment Time of last batch, average of last 5 and last 20 batches

c) Prompting Actions:
- Replenishment Action required as appropriate from Local Supervision, Stock Control, Production Control, Purchasing or Supplier, depending on Part attributes
- Expediting required for late replenishment
- Delinquent reading/timing of Monitoring and Replenishment missions

d) Recommending Planning changes:
- Increase/decrease batch sizes to match target experienced usage
- Increase/Decrease planned replenishment time to match experienced replenishment
e) Transaction/Quantity data provided to main system:
- Period usage/replenishment
- Current Stock holding across line locations

5 The electronic tag can also be retrofitted to existing parts bins and other articles whose status requires monitoring.
CLAIMS

1. An electronic tag comprising an electronic circuit adapted to transmit readable identifier information to an interrogation device and a shielding means movable between a first position in which communication with the interrogation device is inhibited and second position in which communication with the interrogation device is permitted.

2. An electronic tag as claimed in claim 1, wherein the shielding means comprises a metallic material.

3. An electronic tag as claimed in either claim 1 or 2, wherein the circuit is a passive RFID circuit connected to an antenna.

4. An electronic tag as claimed in claim 3, wherein the passive RFID circuit is powered by its antenna being energised by an energising field from the interrogation device.

5. An electronic tag as claimed in any preceding claim, wherein the tag uses a UHF radio frequency for transmitting and receiving data from the interrogation device.

6. An electronic tag as claimed in any of the preceding claim, wherein the tag comprises two or more electronic circuits, adapted to transmit readable identifier information to the interrogation device.

7. An electronic tag as claimed in claim 6, wherein each electronic circuit contains different identifier information.
8. An electronic tag as claimed in either claim 6 or claim 7, wherein the identifier information is a unique ID code.

9. An electronic tag as claimed in claim 8, wherein the unique ID code is chosen from random.

10. An electronic tag as claimed in any of claims 6 to 9, wherein when the shielding means is in the first position, communication between a first of the circuits and the interrogation device is permitted and communication between the second of the circuits and the interrogation device is inhibited.

11. An electronic tag as claimed in claim 10, wherein when the shielding means is in the second position, communication between the second of the circuits and the interrogation device is permitted and communication between the first of the circuits and the interrogation device is inhibited.

12. An electronic tag as claimed in any preceding claim, wherein the article comprises a parts bin and/or a stack of parts bins.

13. An electronic tag as claimed in claim 12, wherein a parts bin comprises a loading chamber and a dispensing chamber separated by a gate having an electronic circuit disposed thereon, the actuation of the gate allowing goods being held in the loading chamber to fall into the dispensing chamber.

14. An electronic tag as claimed in claim 13, wherein the actuation of the gate will deploy or re-deploy shielding means to shield an electronic circuit.
15. An electronic tag as claimed in claim 14, wherein the gate comprises a first and a second electronic circuits and prior to the actuation of the gate, the shielding means is shielding the first circuit and after actuation, it is re-deployed to shield the second circuit.

16. An electronic tag as claimed in either claim 14 or 15, wherein the shielding means is deployable by means of a spring loaded hinge.

17. An electronic tag as claimed in either claim 14 or 15, wherein the shielding means is deployable by means of a spring loaded gate.

18. An electronic tag as claimed in any preceding claim, wherein a printed barcode is adhered to a circuit and/or the tag.

19. An electronic tag as claimed in any preceding claim, wherein the tag is adapted to be received on the article.

20. An electronic tag as claimed in any preceding claim, wherein the tag has an adhesive strip for use in attaching it to the article.

21. A system for assessing the status of an article, wherein the article has an electronic tag as claimed in any preceding claim and the shielding means is mounted on part of the article which is movable between a first position corresponding to the first position of the shielding means and a second position corresponding to a second position of the shielding means.

22. A system as claimed in claim 21, wherein the system comprises a first and a second electronic circuit and whereby the shielding means is deployed over the first electronic circuit and when the status of the
article changes, the shielding means is re-deployed over the second electronic circuit.

23. A system as claimed in any one of claims 21 to 22, wherein the re-deployment of the shielding means is automatic when the status changes.

24. A system as claimed in any one of claims 21 to 23, wherein the reading device can determine the status of the article by assessing whether one or more electronic circuits are screened.

25. A system as claimed in claim 24, wherein the reading device is linked to a database which can be interrogated so as to determine the status of the article.

26. A system as claimed in any of claims 21 to 25, wherein the interrogation device can read multiple circuits.

27. A system as claimed in any of claims 21 to 26, wherein the interrogation device is brought into close proximity to the tag so that identifier information of an un-shielded circuit can be read.

28. A system as claimed in any one of claims 21 to 26 electronic tag as claimed in any preceding claim, wherein the interrogation device is controlled by a central processing unit.

29. A system as claimed in claim 28, wherein the identifier information from a circuit is held on a database in the central processing unit.

30. A system as claimed in claim 29, wherein the central processing unit can determine the status of a given article by comparing whether a circuit in the tag is shielded or un-shielded.
31. A kit of parts for the production of an electronic tag capable of conveying the status of an article to an interrogation device, the kit comprising one or more programmable passive electronic circuits capable of containing readable identifier information, a shielding means capable of shielding at least one circuit from the interrogation device, and an energising reading device capable of communicating with the programmable.

32. A kit of parts as claimed in claim 31, wherein the kit is used to produce an electronic tag as claimed in any one of claims 1 to 20.

33. An electronic device, a system of assessing the status of an object and a kit of parts as claimed in any of claims 1 to 20, 21 to 30 and 31 to 32 respectively and as herein above described with reference to the accompanying figures.
Application No: GB0604067.9
Claims searched: 1-33
Examiner: Mr Richard Howe
Date of search: 19 June 2006

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

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Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC:

- H4L

Worldwide search of patent documents classified in the following areas of the IPC:

- G01V

The following online and other databases have been used in the preparation of this search report:

- Online: wpi; epodoc; paj