

FIELD

- 5 [001] The present invention relates to a label having features that can be used to retrieve identification data.

BACKGROUND

- 10 [002] Steel items such as sheet piles, beams and plates are frequently reused for up to five to eight years before being scrapped. Grade markings on them tend to fade or get lost over this period used, making the steel difficult to grade for compliance and designated future use. If deemed ungradable, the material is classified with the lowest strength grade to prevent any erroneous use that could result in structural failure and lower valuation.

- 15 [003] Traceability for preowned steel is thus problematic. In house techniques to maintain past records include having construction companies keep manual records, such as printed documents. Users and owners cannot readily check or verify that these documents are authentic or that the inventory system is properly maintained.

- [004] There is thus a need to address the above shortcomings.

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SUMMARY OF THE INVENTION

- [005] According to a first aspect of the present invention, there is provided a label for allowing retrieval of identification data, the label comprising: an optically coded region; and a transponder, wherein one is disposed around the other; and wherein data obtained from reading either the optically coded region, the transponder, or both is used to retrieve identification data.

- [006] According to a second aspect of the present invention, there is provided a system comprising a database configured to retrieve the identification data, in response to a match when interrogated with data obtained from reading either the optically coded region, the transponder, or both of the label according to a first aspect of the invention; locate stored content associated with the retrieved identification data; and return the stored content.

BRIEF DESCRIPTION OF THE DRAWINGS

- 35 [007] Representative embodiments of the present invention are herein described, by way of example only, with reference to the accompanying drawings, wherein:

- [008] Figure 1A shows a perspective view of a label in accordance with a first implementation of the present invention, for providing background information on an article.
- [009] Figure 1B shows a top view and a front view of the label of Figure 1A.
- [010] Figure 2 shows a table where each entry stores details assigned to each registered label.
- 5 [011] Figure 3 shows dot encoding on which the optical coded region of the label of Figure 1A is based.
- [012] Figure 4 shows one possible encoding arrangement for the optical coded region of the label of Figure 1A.
- [013] Figure 5A shows the created dot arrangement of Figure 4 being divided into 4 zones.
- 10 [014] Figure 5B shows the 4 zones of Figure 5A after rotation.
- [015] Figures 6A and 6B illustrate show dummy dot permutations when only a portion of an optical code region is active.
- [016] Figure 7 shows information extractable during a data read of the transponder of the label of Figure 1A.
- 15 [017] Figure 8 shows a flow chart to retrieve background content of a product on which the label of Figure 1A is affixed.
- [018] Figure 9 shows a perspective view of a label in accordance with a second implementation of the present invention.

20 **DETAILED DESCRIPTION**

- [019] In the following description, various embodiments are described with reference to the drawings, where like reference characters generally refer to the same parts throughout the different views.
- [020] The present application provides a means to certify the quality of construction materials used
25 such as sheet piles, beams and plates. Such construction materials are typically made of steel which is graded according to its mechanical strength that specifies the material tensile, yield and impact strength. These steel grades determine the chemical composition of the material, ensuring that it is suitable for the proper design and application for its intended use. After a factory produces such steel materials this information is recorded on a Mill Test Certificate (MTC). The MTC can also be used to keep testing
30 records. Accordingly, information recorded on a MTC includes, but is not limited to, testing data, user defined data, subsequent retesting data, welding data, coating, repair, damage, or value added work done.
- [021] Each MTC contains the Heat Number or Serial Number. Known approaches have the Heat Number or Serial Number on a sticker glued or affixed to construction material. Alternatively, the Heat
35 Number or Serial Number is stencilled or sprayed onto the construction material. The Heat number or identification is then verified against that of the MTC. Steel being a ferrous material would corrode in

the presence of oxygen, with the rust preventing a sticker from adhering properly, so that it detaches or deteriorates in due course. Stencilled or sprayed Heat Number or Serial Number identifying the steel would similarly become illegible over time. Stickers may also be misplaced during transportation and tracing construction materials to their MTC becomes challenging.

5 [022] The present application seeks to address the above short comings through the provision of a label to retrieve identification data which is used to retrieve Mill Certificate information, with the label being attachable to construction structures. The label may also be used in sectors other than construction, such as to authenticate the origin of a device or product on which the label is attached. For such alternative usage, the identification data is then linked to other types of content relevant to the device,
10 such as its manufacturing history or background information. This content is stored in a remote database and retrieved using the identification data, the identification data being unique for each label; and the remote database storing the identification data for all labels registered with the remote database and the respective linked content to which each unique identification data is mapped.

[023] Making the background content (such as MTC information) remotely accessible protects it from
15 device degradation. Identification data used to retrieve the background content is also not apparent from the label but kept in a remote database, in contrast to the above discussed approaches where a Heat Number or Serial Number is provided on the product. Obtaining the identification data requires first reading of either or both of two parts on the label: an optically coded region and a transponder. An optically coded region refers to a region where data is expressed as an arrangement of machine readable
20 visual symbols, such as squares or dots. A transponder refers to a wireless device that receives a radio signal and automatically transmits a different signal, such as a RFID tag. Allowing reading of either the optically coded region or the transponder is advantageous because if one cannot be read, the other can be used to retrieve the identification data. The reading of both parts is, for example, in circumstances where additional security may be required, like a suspected compromise in security of the data encoded
25 in one of the two parts being discovered by an unauthorised party. Secondly, the data obtained from reading the optically coded region, the transponder, or both is then used to interrogate a mapping table maintained in the remote database for a match, the mapping table recording the identification data for labels registered with the remote database. The identification data belonging with the matching data is retrieved.

30 [024] The label has a body or substrate on which such an optically coded region and such 'a transponder are provided, with one being disposed around the other. That is, in a first implementation the optically coded region is disposed around the transponder, while in a second implementation the transponder is disposed around the optically coded region.

[025] Either of the optically coded region or the transponder need not necessarily surround (or
35 encircle) the other completely. For example, in the case where the optically coded region is disposed around the transponder, the optically coded region may be implemented as a collection of several zones

(i.e. a plurality of zones), with each zone being on a surface of the label body and adjacent to one side of the transponder. These several zones may be discontinuous or discrete in that there are gaps between the zones, so that the optically coded region does not completely encircle the transponder. Similarly, in the case where the transponder is disposed around the optically coded region, the transponder may not extend over the optically coded region entirely. In one implementation, only certain components of the transponder, such as its antenna, surrounds the optically coded region.

[026] Data obtained from reading the optically coded region; or data obtained from reading the transponder; or a combination of both is used to retrieve the identification data that is linked to content associated to a device on which the label is fixed. Accordingly, the present application splits the data needed to perform identification data retrieval to be communicated over two media forms: a visual medium for communicating data through optical recognition (the optically coded region) and a wireless medium for communicating data stored in electronic form (the transponder). In the implementation where data read from the optically coded region is combined with data read from the transponder to retrieve the identification data, the proximity from having either surround the other allows one pass retrieval. This results in the label being compact and confines the portion responsible for retrieving the identification data to a specific segment. Full utilisation of available limited real estate (surface area) is achieved.

[027] The label is described in greater detail below in conjunction with the accompanying Figures.

[028] Figure 1A shows a perspective view of a label 100 in accordance with a first implementation of the present invention, for providing background information on an article (not shown) on which it is attached. This background information is stored in a remote database, thereby not restricting the content to the amount of space available on the label 100. As such, the label 100 can be used to trace the history of the article or for authentication purposes (such as to prove the article is genuine). When attachable to construction structures, such as sheet piles, beams and plates, the label 100 can be used to retrieve Mill Test Certificate (MTC) information, along with testing data, user defined data, subsequent retesting data, welding data, coating, repair, damage, or value added work done. When attached to other articles, the label 100 can be used to retrieve other information such as manufacturing and supply chain details.

[029] The label 100 has a body 102 which provides a substrate for carrying features required to retrieve the content hosted in the remote database. These features are an optically coded region 104 and a transponder 106, located in proximity to each other. In the implementation shown in Figure 1A, this proximity is achieved by the optically coded region 104 being disposed around the transponder 106. In another implementation (see Figure 9), this proximity is achieved by the transponder being disposed around the optically coded region. Accordingly, either of the optically coded region or a portion of the label that holds the transponder is disposed around the other.

[030] The optically coded region 104 may be coded by expressing its data through machine readable symbols arranged in accordance with a protocol specification. Figure 1A shows the use of a DotCode

standard, explained below with reference to Figures 3, 4, 5A, 5B, 6A and 6B, encodes the data in an array of dots. Similarly, the transponder 106 may also be coded by having its data stored, for example, as an alphanumeric sequence. Extraction of the data from reading the optically coded region 104, the transponder 106 or both may be performed by a scanner. Examples of a scanner include a dedicated handheld device having both an optical scanner and a transponder; or a smartphone running an app that allows it to extract the optical data from an image taken of the optically coded region 104 and the data from wirelessly communicating with the transponder 106. Retrieval of identification data from this data read and the use of the identification data to in turn retrieve stored content is described with reference to Figure 2.

10 [031] Figure 2 shows a table 200 where each entry 220, 222, 224 stores details assigned to each label registered with a cloud remote database 250. This table 200 may be maintained in the cloud remote database 250.

[032] The assignable details for each entry 220, 222, 224 include the optically coded region data 204, the transponder data 206, label identifier 210, asset identifier 214 and information 208 on content stored in the cloud remote database 250 to which the entry 220, 222, 224 is linked. As mentioned above, the optically coded region data 204 and the transponder data 206 are encoded into the optically coded region 104 and the transponder 106 of the label respectively. For the sake of simplicity, the table 200 only shows three entries 220, 222, 224, being a fraction of records kept on the cloud remote database 250.

15 [033] The transponder data 206 comprises two components: electronic product code (EPC) data 226 which can be programmed to adapt the transponder 106 for application requirements; and RFID data 228 which is RFID standard data that cannot be changed. EPC data 226 is typically 16 characters long, as shown in Figure 7.

[034] Label identifier 210 is unique to each label 100 and distinguishes one from another. Several products, each affixed with its own label 100, may be a segment separated from a bulk article, with the bulk article having its own asset identifier 214. Each of the several products thus share the same background as the bulk article. For example, a steel sheet may have several labels 100 affixed. If the steel sheet is separated with each segment with a label 100 thereon, each of these segments should be traceable to the asset identifier 214 used for the steel sheet. That is, one or more unique identification data 210 may be associated with the same asset identifier 214, where both the unique identification data 210 and the asset identifier 214 point to the same background content stored in the cloud remote database 250, see entries 220 and 222. In the implementation shown in Figure 2, the asset identifier 214 serves as identification data to retrieve background content of the product on which the label 100 is affixed.

25 [035] Following retrieval of either the optically coded region data 204 or the transponder data 206 by the scanner, the table 200 is interrogated with the read data to determine whether there is a match, i.e. an entry 220, 222, 224 that contains the same optically coded region data 204 or the transponder data

206. In the implementation where both the optically coded region data 204 and the transponder data 206 are needed (i.e. each of the optically coded region 104 and the transponder 106 holds a part of the data used to perform interrogation of the table 200), the table 200 is interrogated with a combination of the optically coded region data 204 and the transponder data 206 to determine whether there is a match, i.e. an entry 212 that contains the same combination of data. If a match exists, the interrogation of the table 200 with either the optically coded region data 204, the transponder data 206, or both results in returning the asset identifier 214 for use as identification data to retrieve content from the cloud remote database 250. This identification data 214 is then used to access 252 content stored in the cloud remote database 250 providing the background of the product on which the label 100 is affixed.

10 [036] As mentioned above, the identification data 214 may be used to retrieve Mill Certificate data when the label 100 is attached onto steel structures. The identification data 214 provides an asset identifier (AID) for steel material to reference all relevant traceability information documented in Mill Certificate, Factory Production Certificates, and any other testing reports and certificates stored in the cloud remote database 250, so that they can be easily retrieved and verified. AID is unique to every

15 product, including but not limited to steel structures.

[037] When steel material is stored in bundles or stacks, AIDs are grouped together in the form of a bundle tag. This bundle tag helps to easily identify the AIDs that belong to the bundle tag and can later be regrouped according to the customer's preference. This bundle tag has a higher read range than the transponder 106 in the label 100, such as 5m.

20 [038] The identification data 214 can also be used to update stored content in the cloud remote database 250 for later retrieval or reference. For example, length changes, cutting or fabrication work being done onto the article on which the label 100 is attached can be logged accordingly. Ownership data about the article can be recorded and traced throughout its lifecycle. This allows transfer the data onto a next owner if the article is sold, so that the next owner will have a record of the complete history

25 of the article. The cloud remote database 250 used to store and update content may also be secured with restricted access and maintained by, for example, the original supplier of the article to provide a database that is separate from the database belonging to parties that acquire the article, to provide an independent record of the article history that can be trusted.

[039] The identification data 214 can also be used for on-site inspection of construction materials on which the label 100 is attached. When the construction materials are sent out of a customer's yard to a

30 site, the labels 100 attached thereto can be scanned on site to facilitate tracking of project requirements. Upon completion of the project and return of tagged construction materials to the storage yard, their labels 100 can be individually scanned so that yard personnel will be aware of the construction materials being returned to ensure that the correct construction materials are being returned.

35 [040] Figure 1B shows a front view 160 and a top view 162 of the label 100, the front view 160 being as seen from line AA of the top view 162. The optically coded region 104 is provided on a surface of

the body 102, such as by being etched into the top 154, bottom 156 or both surfaces of the label 100. Thus, if the label 100 is attached via either its top 154 or bottom 156 surfaces to an article, the optically coded region 104 remains visible and readable by a scanner. Since the optical coded region 104 can be provided on both top 154 and bottom surfaces 156 of the label 100, the etch need only be a few mm
5 deep and does not need to extend through the entire thickness 158 of its body 102. While not shown, the optically coded region may also be provided on the top, bottom or both surfaces of the label in the implementation where the transponder is disposed around the optically coded region.

[041] The optically coded region 104 spans across a plurality of zones 104A, 104B, 104C and 104D that are disposed around the transponder 106, dividing the optical coded region 104 over several
10 portions on the surface of the label 100. This allows the optically coded region 104 to occupy a larger surface area, which provides more flexibility on a protocol choice to encode its data and for the data to have a longer length. At least one of the zones 104A, 104B, 104C and 104D may be discontinuous from the other zones by, for example, the presence of a gap between them, as shown in Figure 1A. This discontinuity facilitates demarcating or isolating one zone 104A, 104B, 104C and 104D from another.

[042] It is also possible for the optically coded region to be divided in the same manner (i.e. across a plurality of zones with each of the zones being optionally discontinuous from the other zones) in the implementation of Figure 9 where the transponder is disposed around the optically coded region. In contrast to Figure 1A and Figure 1B, this plurality of zones is not disposed around the transponder.

[043] One or more of the zones 104A, 104B, 104C and 104D may be combined during the data read
20 of the optically coded region 104. Accordingly, not all the zones 104A, 104B, 104C and 104D need to be read, but only a selection during the data read of the optical coded region 104. The designation of which of the zones 104A, 104B, 104C and 104D is active and their selection is in accordance with a programmed protocol. This provides an additional layer of security to that of the data already being optically encoded in accordance with a protocol which may be different from the protocol designating
25 which of the zones 104A, 104B, 104C and 104D is active. Additional advantages for dividing the optically coded region 104 into a plurality of zones are that it is harder for unauthorised parties to decipher the correct code stored in the table 200 (refer Figure 2) from performing a read operation on the optically coded region 104. There are more permutation options should there be a need to change the active regions of the optically coded region 104, so that reading the optically coded region 104
30 produces different data. Only authorised parties with access to the protocol used to encode the optically coded region 104 can readily perform a data read of the optically coded region 104. A further permutation option requires for only a portion of one of the zones 104A, 104B, 104C and 104D to be active, e.g. during a data read of the optically coded region 104, only a portion of zone 104A is read and not the entire zone 104A.

[044] It was found that QR codes, which codes data in blocks or squares, are difficult to inscribe with consistency onto the label 100. Dots were easier to be lasered consistently as holes onto a surface of the

label 100 in an arrangement that encodes data, for example the 2D array 300 shown in Figure 3. The length of the code is determined by the number of rows and columns of dots. To achieve a code having a length of five characters (which provides sufficient permutations, where the first character is an alphabet or symbol and the last four being numerals), the 2D array 300 may need, for example, a height 5 302 of 11 dots and a width 304 of 16 dots.

[045] The five character code may be generated randomly, followed by the creation of dot arrangement within the 11 X 16 dots array to encode the generated 5 character code. Figure 4 shows the created dot array arrangement 400 that will be used to realise the optically coded region 104. In Figure 4, the creation of the dot array arrangement 400 is on the premise that the surface of the label 10 100 has more than sufficient space to accommodate its 11 X 16 dots dimensions and has dummy dots 402 to fill up the excess space.

[046] The created dot arrangement 400 is then divided into the 4 zones 104A, 104B, 104C and 104D as shown in Figure 5. The zones 104A, 104B, 104C and 104D may then be subject to 90 degree or 180 degree rotations. For example, zone 104A is rotated 90 degrees clockwise, while zone 104C is rotated 15 90 degrees anticlockwise. Zone 104D is rotated 180 degrees clockwise. Zone 104A remains stationary. This combination of rotations increases the different permutations that can be used to encode the optically coded region 104. The resulting array arrangement 500, shown in Figure 5B, is then lasered onto the label 100.

[047] Figures 6A and 6B shows other permutations of dummy dots. In these permutations, only the 20 active region 602 and 604 respectively of the generated dot array arrangement 400 is used during a data read of the optically coded region 104.

[048] The following steps are performed when the optically coded region 104 is read. All the four zones 104A, 104B, 104C and 104D are captured, for example, as an image by a mobile phone. The image is then uploaded to the cloud remote database 250 (refer Figure 2) for processing by the protocol 25 used to generate the dot array arrangement used to encode the optically coded region 104. This protocol will identify the active region within the optically coded region 104 from which optically coded region data is extracted. The table 200 is then interrogated for a match to retrieve the identification data 214.

[049] Returning to Figure 1B, the body 102 has a tunnel 114 extending through its thickness 158 (i.e. a through hole) for housing the transponder 106 (refer Figure 1A), wherein the optically coded region 30 104 is disposed around the tunnel 114. In another embodiment (not shown), the transponder 106 is housed in a depression which does not go through the entire depth of the body 102. The transponder 106 is held in place in the tunnel 114 or the depression (not shown), for example, with sealant.

[050] The transponder 106 may have components that include a microchip; and an antenna coupled to the microchip. An RFID tag may be used for the transponder 106, where its microchip has the unique 35 identification number of the RFID tag. The transponder 106 may be passive in that it does not have a power source; but receives power from radio signals transmitted from the scanner used to read it. A

passive transponder 106 is advantageous for allowing the label 100 to be used on products that are flammable. The transponder 106 will operate when the scanner is in proximity. The antenna coil will act as a power source and medium to transfer data to the scanner. In the implementation where the transponder is disposed around the optically coded region, only a portion of the transponder may be disposed around the optically coded region, such as its antenna. The antenna may, for example, be located along a perimeter of the label, as shown in Figure 9.

[051] Mounting holes 112 are provided at opposite ends of the label 100 for attachment to an article to which the label 100 is used to provide background information. The mounting holes 112 extend through the thickness of the label 100. Each mounting hole 112 is spaced 116 a distance from the closest adjacent zone of the optical coded region 104, being the zones 104B and 104D in the implementation shown in Figure 1A. This space 116 protects the optical coded region 104 from damage (such as charring) when the label 100 is attached to an article, such as through a welding operation.

[052] Sample dimensions of the body 102 of the label 100 are as follows: a length of around 60mm (measured from opposite ends adjacent to the mounting holes 112) and a width of around 20mm (measured across the tunnel 114 for the transponder 106). The body 102 may have a thickness of around 7mm. The diameter of the tunnel 114 is around 10mm. A diameter of around 8mm is used for the mounting holes 112 to facilitate welding.

[053] Figure 7 shows information extractable during a data read of the transponder 106. The data read may capture EPC data stored in the transponder 106, which may for example be programmed with basic information 700 on the article on which the label 100 is attached.

[054] The basic information 700 is represented using 16 characters of alphanumeric data, having a segmented layout, with each segment having a dedicated function. A first segment 302 may be used for branding purposes, such as to indicate the supplier of the article. A second segment 304 may be used to represent a country in which the article is manufactured. A third segment 306 may be used to provide the code for the supplier of the article. A fourth segment 308 may be used to provide a batch number to which the article belongs. A fifth segment 310 is reserved for allocating a serial number for the transponder 106. Any one or more of these five segments is programmable to meet application needs.

[055] Figure 8 shows a flow chart to retrieve background content of a product on which the label 100 is affixed.

[056] In step 802, a user logs into an application running on their mobile phone that is used to scan the label 100 and retrieve background information of the product on which the label 100 is affixed. Sensors in the mobile phone that are needed to communicate with the label 100 are activated in steps 804 and 806, such as its Bluetooth function, location detection and NFC (near field communication) sensor. The mobile phone then reads the optically coded region 104, the transponder 106 or both on the label 100 via its camera and its NFC sensor respectively in steps 808 and 810.

[057] In step 812, the mobile phone connects with the cloud remote database 250 to send the read data in the steps 808 and 810. In step 814, the cloud remote database 250 is interrogated as described with reference to Figure 2. The retrieved background information and documents for the product is downloaded from the cloud remote database 250 in step 816, where they may be printed in step 818.

5 The process the ends in step 820 with the user logging off from the application.

[058] Figure 9 shows a perspective view of a label 900 in accordance with a second implementation of the present invention, for providing background information on an article (not shown) on which it is attached.

[059] The label 900 has a body 902 which provides a substrate for carrying features required to

10 retrieve the content hosted in the remote database. These features are an optically coded region 904 and a transponder 906 (antenna 950 being visible), located in proximity to each other. In the implementation shown in Figure 9, this proximity is achieved by the transponder being disposed around the optically coded region 904.

[060] Like the label 100 of Figure 1, the optically coded region 904 of the label 900 of Figure 9 may

15 be coded by expressing its data through machine readable symbols arranged in accordance with a protocol specification, such as the dot array arrangement described with reference to Figures 3, 4, 5A, 5B, 6A and 6B. The transponder 906 may also be coded by having its data stored, for example, as an alphanumeric sequence. Extraction of the data from reading the optically coded region 904, the transponder 906 or both may be performed by a scanner. Retrieval of identification data from this data

20 read and the use of the identification data to in turn retrieve stored content uses the approach as described with reference to Figure 2.

[061] Like the label 100 of Figure 1, the transponder 906 may have components that include a microchip; and an antenna 950 coupled to the microchip. An RFID tag may be used for the transponder 906, where its microchip has the unique identification number of the RFID tag. The transponder 906

25 may be passive in that it does not have a power source; but receives power from radio signals transmitted from the scanner used to read it. A passive transponder 906 is advantageous for allowing the label 900 to be used on products that are flammable. The transponder 906 will operate when the scanner is in proximity. The antenna 950 will act as a power source and medium to transfer data to the scanner. The implementation of Figure 9 has the antenna 950 disposed around the optically coded region 904, along

30 a perimeter of the label 900.

[062] Mounting holes 912 are provided at opposite ends of the label 900 for attachment to an article to which the label 900 is used to provide background information. The mounting holes 912 extend through the thickness of the label 900. Each mounting hole 912 is spaced 916 a distance from the closest adjacent zone of the optical coded region 904, being the zones 904B and 904D in the implementation

35 shown in Figure 9A. This space 916 protects the optical coded region 904 from damage (such as charring) when the label 900 is attached to an article, such as through a welding operation.

[063] From the above, the label 100, 900 thus facilitates the following:

- Inventory and location tracking
- Asset management & financial valuation of assets
- Accreditation and assurance
- 5 • Provides unique identification to tagged material
- Detection and monitoring of tagged assets

[064] In the application, unless specified otherwise, the terms "comprising", "comprise", and grammatical variants thereof, intended to represent "open" or "inclusive" language such that they include recited elements but also permit inclusion of additional, non-explicitly recited elements.

10 [065] While this invention has been described with reference to exemplary embodiments, it will be understood by those skilled in the art that various changes can be made and equivalents may be substituted for elements thereof, without departing from the scope of the invention. In addition, modification may be made to adapt the teachings of the invention to situations and materials, without departing from the essential scope of the invention. Thus, the invention is not limited to the examples
15 that are disclosed in this specification but encompasses all embodiments falling within the scope of the appended claims.

CLAIMS

1. A label for allowing retrieval of identification data, the label comprising
an optically coded region; and
5 a transponder,
wherein one is disposed around the other; and wherein data obtained from reading either the
optically coded region, the transponder, or both is used to retrieve identification data.
2. The label of claim 1, wherein the optically coded region is etched into either top or bottom
10 surfaces, or both.
3. The label of claim 1 or 2, wherein the optically coded region spans across a plurality of zones.
4. The label of claim 3, wherein at least one of the zones is discontinuous from the other zones.
5. The label of claim 3 or 4, wherein the data read of the optically coded region comprises
15 combining data selected from one or more of the zones.
6. The label of claim 5, wherein the selection of the one or more zones is in accordance with a
programmed protocol.
- 20 7. The label of any one of the preceding claims, wherein the transponder comprises
a microchip; and
an antenna coupled to the microchip.
8. The label of claim 7, wherein the antenna is disposed around the optically coded region.
- 25 9. The label of claim 8, wherein the antenna is located along a perimeter of the label.
10. The label of any one of the claims 1 to 7, further comprising
a tunnel extending through a thickness of the label for housing the transponder,
30 wherein the optically coded region is disposed around the tunnel.
11. The label of claim 10, wherein the transponder is held in place with sealant.
12. The label of any one of the preceding claims, wherein the optically coded region comprises an
35 array of holes.

13. The label of any one of the preceding claims, wherein the transponder is passive.
14. The label of any one of the preceding claims, further comprising
mounting holes provided at opposite ends of the label.
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15. The label of any one of the preceding claims, wherein the identification data is used to retrieve
background information of a product on which the label is fixed.
16. A system comprising
10 a database configured to
retrieve the identification data, in response to a match when interrogated with data
obtained from reading either the optically coded region, the transponder, or both of the label of
any one of the preceding claims;
locate stored content associated with the retrieved identification data; and
15 return the stored content.