An RFID label and optional secondary security label ensures the authenticity of a beverage contained in a beverage container. The RFID label cannot be removed without destroying the RFID label or rendering it inoperative. A secondary security label may be placed over the closure of the beverage container to provide a secondary measure against tampering as well as a visual indicator of authenticity. It is placed on a portion of the bottle, a portion of the beverage container’s closure, and the RFID label. An attempt to remove the secondary security label will also render the RFID label unusable.
Deposit Beverage in Beverage Container

Close and seal Beverage Container

Apply RFID label

Apply Security Label

Authenticate Provenance of Beverage in Beverage Container

Prior to Beverage leaving Origin

After Beverage Leaves Origin

300

302

320

322

310

FIG. 4
BEVERAGE CONTAINER AUTHENTICITY AND PROVENANCE DEVICES AND METHODS

RELATED APPLICATION


BACKGROUND

[0002] The present disclosure relates to maintaining the authenticity and preventing of counterfeiting of beverage containers.

SUMMARY

[0003] An RFID label and optional secondary security label ensures the authenticity of a beverage contained in a beverage container. The RFID label cannot be removed without destroying the RFID label or rendering it inoperable. The secondary security label may be placed over the closure of the beverage container to provide a secondary measure against tampering, as well as a visual indicator of authenticity. The secondary security label is placed on a portion of the bottle, a portion of the beverage container’s closure, and a portion of the RFID label. An attempt to remove the secondary security label will also render the RFID label unusable.

[0004] According to a feature of the present disclosure, a device is disclosed comprising an RFID tag permanently affixed to a beverage container. The RFID tag is affixed over a closure of the beverage container and at least a portion of the container. Additionally, the RFID tag is disposed whereby the RFID tag is inactivated upon opening the beverage container or inactivated if it is removed from the beverage container.

[0005] According to a feature of the present disclosure, a method is disclosed comprising generating a unique electronic product code, providing an RFID tag that communicates to an RFID reader at least the unique electronic product code, allowing the RFID tag to be affixed to a beverage container such that the RFID tag is inactivated if it is removed from the beverage container or the beverage container is opened.

[0006] According to a feature of the present disclosure, a method is disclosed comprising authenticating as genuine a beverage contained in a beverage container and affixing an RFID tag to the bottle. The RFID is inactivated if the beverage container is opened or if the RFID tag is removed.

DRAWINGS

[0007] The above-mentioned features and objects of the present disclosure will become more apparent with reference to the following description taken in conjunction with the accompanying drawings wherein like reference numerals denote like elements and in which:

[0008] FIG. 1 is a perspective view of an embodiment of a beverage container authenticity and provenance device;

[0009] FIG. 2 is a perspective view of an embodiment of a beverage container authenticity and provenance device with a visual security member attached;

[0010] FIG. 3 is a perspective view of an embodiment of a case containing beverage containers having authenticity and provenance devices connected, and

[0011] FIG. 4 is a flow diagram of an embodiment of the processes of authentication of application of an RFID label to a beverage container.

DETAILED DESCRIPTION

[0012] In the following detailed description of embodiments of the invention, reference is made to the accompanying drawings in which like references indicate similar elements, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that logical, mechanical, biological, electrical, functional, and other changes may be made without departing from the scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the appended claims. As used in the present disclosure, the term “or” shall be understood to be defined as a logical disjunction and shall not indicate an exclusive disjunction unless expressly indicated as such or noted as “xor.”

[0013] According to embodiments and as illustrated in FIG. 1, there is shown a security and authenticity labeling system to be used on beverage containers 100. Beverage container 100 may comprise containers holding beverages, including bottles of all sizes, such as wine bottles, cans, carafes, and jars. Beverage containers 100 are closed or sealed as would be known to artisans, for example by screw top caps, corks and capsules, can tabs, perforated capsules (e.g., water bottle capsule lids), lids that affix by friction (e.g., the lid on a gallon of milk), etc. According to embodiments, where a bottle is used, capsule 120 is placed over beverage container opening that employ less secure methods of closing, for instance corks. According to embodiments, beverage container 100 is corked after wine is put into beverage container 100 which comprises a wine bottle. After the closing of beverage container 100, capsule 120 is placed over the former opening of beverage container 100, covering the former opening as well as portion of beverage container neck 110. The devices used to close or seal beverage container 100 comprise the closure. For example, closure may comprise a cork and capsule 120. Alternatively, the closure may comprise a screw top or can tab, according to various embodiments.

[0014] To ensure authenticity and security and according to embodiments, RFID label 130 is permanently affixed to the closure of beverage container 100. RFID label 130 is also permanently affixed to at least one portion of beverage container 100 or beverage container neck 110. Thus, beverage container 100 cannot be opened without destroying or permanently disabling RFID label 130.

[0015] For example, beverage container 100 is a wine bottle. Beverage container 100 is corked at the winery and a capsule is placed over the cork and beverage container neck 110, as known and understood by artisans. RFID label 130 is then permanently affixed to capsule 120 and a portion of beverage container neck 110.

[0016] According to embodiments, RFID label 130 is a passive RFID device comprising at least an integrated circuit and an antenna, as known to artisans. RFID label 130 is placed such that it is permanently affixed to a portion of beverage container next 110 and placed onto capsule 120, thereby preventing removal of either the capsule or opening beverage container 100 without causing irreparable damage
to RFID label 130. According to embodiments, RFID label is permanently affixed to beverage container neck 110, placed across at least a portion of capsule 120, and to a second portion of beverage container neck 110, thereby preventing opening of beverage container 100 without removal of the capsule.

[0017] According to embodiments, suitable adhesives, including epoxy-based adhesives or permanent pressure sensitive adhesives, are used to affix RFID label 130 to beverage container neck 110. Generally, the adhesive used prevents the label from being removed from beverage container 100 without damaging RFID label 130. The same or a different suitable adhesive is used to affix RFID label 130 to capsule 120.

[0018] According to embodiments and as illustrated in FIG. 2, security label 200 is affixed over the closure, RFID label 130, beverage container neck 110. Placement of security label 200, according to embodiments, prevents access to the edges of the closure, for example the bottom of capsule 120 as illustrated in FIG. 2. Security label 200 adheres to capsule 120, beverage container neck 110, and RFID label 130 via a suitable adhesive such as epoxy based adhesives or permanent pressure sensitive adhesives. According to embodiments, if security label 200 is removed, it will render RFID label 130 inoperative. Accordingly, the adhesive used to secure security label 200 will require more force to remove than the force necessary to cause damage to RFID label 130 upon removal of security label 200. Thus, removal of security label 200 will render RFID label 130 inoperative if it is removed from beverage container 100.

[0019] Naturally, the adhesive affixing security label 200 to beverage container 100 will be tamper-resistant, which will prevent removal of security label 200 using heat or chemical agents to degrade the adhesive. Not only will security label 200 render RFID label 130 inoperative upon removal, it also provides a visual confirmation as to whether the beverage container is authentic or whether it has been tampered with, etc.

[0020] According to embodiments, security label 200 is made from polyethylene terephthalate (PET) polyester (i.e., Mylar). According to embodiments, the PET selected is treated to make it “no-tear,” for example by applying a layer of polyethylene to PET security label 200. PET security label 200 affixes to capsule 120, RFID label 130, and beverage container neck 110 such that the surface of the PET is smooth. If PET security label 200 is removed, it will “crumble” and be unable to be reattached such that the surface is smooth. Similarly, according to embodiments, an adhesive or chemical agent may be selected and applied under PET security label 200 that changes appearance if tampered with (e.g., heated or chemicals applied), thereby providing visual clues as to whether security label 200 has been tampered with.

[0021] According to embodiments, RFID labels 130 may be affixed in other locations. For example, RFID label 130 may be affixed over the top of a cork or within a cork on a wine bottle because the cork must be removed. However, as known in the art, corks are removable without corkscrews; thus, RFID labels 130 affixed to the top or inside of a cork would be able to be removed without rendering RFID label 130 inoperative. PET security label 200 is affixed over cork and neck of bottle, according to embodiments, whereby removal of PET security label provides either the visual indicia of tampering or cannot be replaced in its original smooth configuration, as described above.

[0022] According to embodiments and as illustrated in FIG. 3, beverage containers 100 having RFID labels 130 affixed may be packaged in cases 140 for shipment. Each case 140 may have RFID label 130 similarly affixed. Thus, retailers, wholesalers, and consumers can readily determine, based on a correlation of data either stored on RFID label 130 affixed to case 140 or by using the electronic product code embedded in RFID label 130 affixed to case 140 whether the correct individual beverage containers 100 are contained in each case 140. Thus, one can readily determine if tampering has occurred not only with single beverage containers 100, but also by evaluating the contents of each case 140.

[0023] The present disclosure discloses methods of providing a tool for ensuring authenticity of beverages contained in beverage containers as illustrated in FIG. 4. According to embodiments, an RFID label is applied to a beverage container to ensure authenticity and provenance of the contents of the beverage container over the course of time. The RFID labels may be applied either at the origin of the beverage or at a later time and location.

[0024] Placement of an RFID label and security label, according to embodiments, are applied at the point of origin. After the beverage is deposited in the beverage container in operation 300 and the beverage container is closed and sealed using the closure device in operation 302, the RFID label is applied over the closure and at least a portion of the beverage container in operations 320, as described in detail above. Optionally, according to embodiments, security label is applied over at least a portion of the RFID label in operation 322, as described in detail above. An adhesive is used to ensure the RFID label and security label cannot be removed without destroying or rendering inoperable the RFID label, according to embodiments. Thus, the closure cannot be removed without destroying the RFID label, and the RFID label cannot be removed without destroying it. Moreover, the RFID label cannot be easily removed and applied to counterfeit beverages. According to similar embodiments, security label changes appearance if removed or tampered with.

[0025] Placement of an RFID label, and optionally a security label, may be applied after the beverage has departed from its point of origin, according to embodiments. Prior to applying the RFID label, the beverage contained in the beverage container is authenticated in operation 310. Thereafter, the RFID label and security labels are applied in operations 320, 322.

[0026] For example, an aged wine originated prior to the advent of RFID technologies. According to embodiments, an expert authenticates the aged bottle of wine as genuine, after which an RFID label is applied as disclosed herein. Thus, after a particular beverage is deemed to be authentic, the RFID label provides continuing assurance that the particular bottle is genuine, as well as records provenance data from that point on.

[0027] While the apparatus and method have been described in terms of what are presently considered to be the most practical and preferred embodiments, it is to be understood that the disclosure is not to be limited to the disclosed embodiments. It is intended to cover various modifications and similar arrangements included within the spirit and scope of the claims, the scope of which should be accorded the broadest interpretation so as to encompass all such modifications and similar structures. The present disclosure includes any and all embodiments of the following claims.
1. A device comprising:
an RFID tag permanently affixed to a beverage container,
wherein the RFID tag is affixed over a closure of the
beverage container and at least a portion of the conten-
ter; and
wherein the RFID tag is disposed whereby the RFID tag is
inactivated upon opening the beverage container; and
wherein the RFID tag is inactivated if it is removed from
the beverage container.
2. The device of claim 1, further comprising a security label
affixed over at least a portion of the RFID tag, whereby the
RFID tag is inactivated if the security label is removed.
3. The device of claim 1, further comprising a security label
affixed over at least a portion of the RFID tag, whereby the
security label or a chemical agent associated with the security
label in a first visual appearance assumes a second visual
appearance if the security label is tampered with or removed.
4. The device of claim 1, wherein the beverage container is
a wine bottle.
5. The device of claim 1, wherein the RFID tag covers a
portion of the beverage container in at least two locations to
prevent removal of the closure without inactivation of the
RFID tag.
6. The device of claim 5, wherein the closure is a capsule of
a wine bottle.
7. A method comprising:
generating a unique electronic product code;
providing an RFID tag that communicates to an RFID
reader at least the unique electronic product code;
allowing the RFID tag to be affixed to a beverage container
such that the RFID tag is inactivated if it is removed from
the beverage container or the beverage container is
opened.
8. The method of claim 7, wherein the beverage container is
a wine bottle.
9. The method of claim 7, wherein the electronic product
code is correlated to the specific beverage container to which
it is affixed.
10. The method of claim 8, wherein at least provenance
data is correlated with the electronic product code and the
specific beverage container.
11. The method of claim 7, wherein the RFID tag is affixed
at the origin of the beverage container.
12. The method of claim 7, wherein the RFID tag is affixed
after the authenticity of the beverage and beverage container
are determined.
13. The method of claim 7, further comprising allowing a
security label to be affixed over at least a portion of the RFID
tag, whereby the RFID tag is inactivated if the security label
is removed.
14. The method of claim 7, further comprising allowing a
security label to be affixed over at least a portion of the RFID
tag, whereby the security label or a chemical agent associated
with the security label in a first visual appearance assumes a
second visual appearance if the security label is tampered
with or removed.
15. A method comprising:
authenticating as genuine a beverage contained in a beverage
container;
affixing an RFID tag to the bottle, whereby the RFID is
inactivated if the beverage container is opened or if the
RFID tag is removed.
16. The method of claim 15, wherein the beverage is wine
and the beverage container is a wine bottle.
17. The method of claim 15, wherein the authentication
process comprises filling the beverage container with the
beverage and closing the container.
18. The method of claim 15, wherein the authentication
process comprises a determination of the authenticity of the
beverage contained in the beverage container after the beverage
container is filled with the beverage and the container is
closed.
19. The method of claim 15, wherein a security label is
affixed to the RFID tag and at least one of the beverage
container and a closure device, whereby the RFID tag is
inactivated if the security label is removed.
20. The method of claim 19, wherein the security label is
placed at least around a circumference of an outer surface of
the closure and around a circumference of an outer surface of
the beverage container.
21. The method of claim 20, wherein the beverage con-
tainer is a wine bottle and the closure is a capsule.
22. The method of claim 15, further comprising a security
label affixed over at least a portion of the RFID tag, whereby
the security label or a chemical agent associated with the
security label in a first visual appearance assumes a second
visual appearance if the security label is tampered with or
removed.

* * * * *