

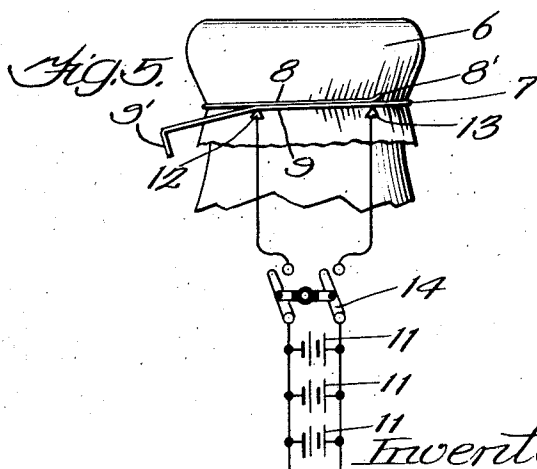
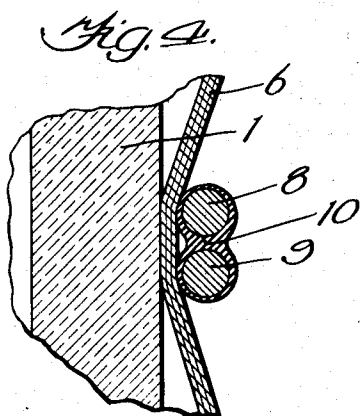
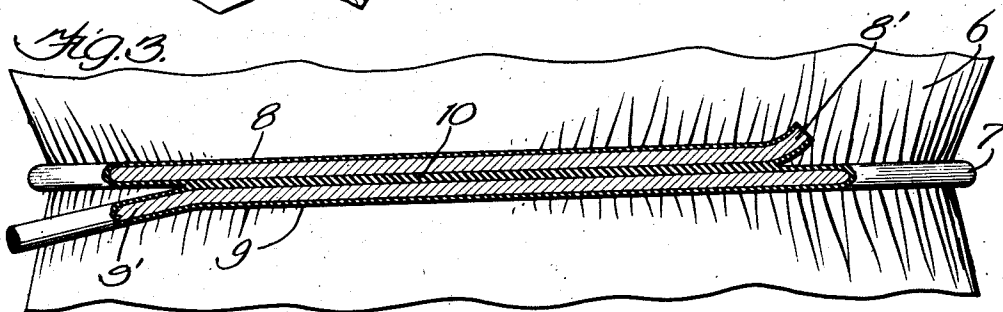
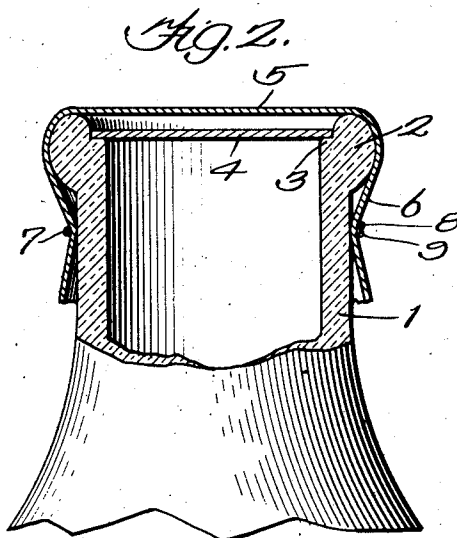
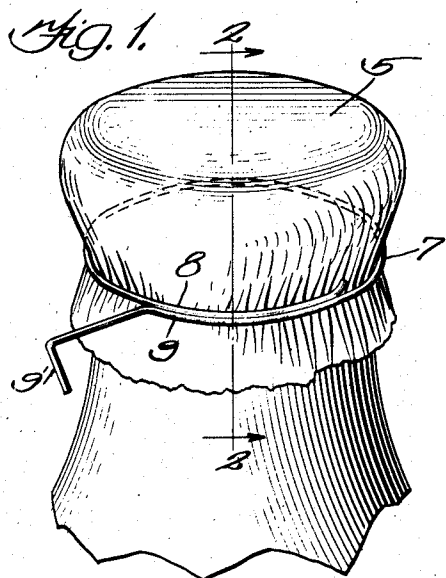
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BOTTLE CLOSURE AND METHOD OF PRODUCING THE SAME

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UNITED STATES PATENT OFFICE.

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BOTTLE CLOSURE AND METHOD OF PRODUCING THE SAME.

Application filed May 20, 1926. Serial No. 110,447.

My invention relates to bottle closures and to a method of producing the same.

The method of my invention has a number of characteristics. Generally speaking, it consists in placing a skirted cap over the mouth of the bottle and about the bottle neck, placing a ring about the cap skirt and bottle neck, contracting the ring into tight engagement with the cap by relatively moving adjacent portions oppositely and circumferentially, placing a bond between said ring portions that is inclusive of cement that will flux in response to heat, applying sufficient heat in the region of said ring portions and bond to cause the cement to flux, and permitting the cement to harden while the ring is contracted to hold said ring portions in ring contracting relation. In the method, as preferably practiced, the ring is of such circumferential length that the adjacent portions thereof that are oppositely and circumferentially moved to contract the ring are brought into mutually lapping relation so that they may be merely torn apart when the cap is to be removed to afford access to the bottle covered by the cap. The cement is desirably provided directly upon these ring portions whereby the ring, itself, is inclusive of a constituent which will flux in response to heat. The caps are usually formed of combustible material, such as paper, and the mutually lapping portions of the rings are preferably tinned so as to be readily fluxed by heat which will not harmfully burn the caps.

In the preferred way of practicing the method of my invention, the necessary heat is furnished by an electric current of suitable volume and pressure, passed through a portion of the ring, the ring being preferably metallic, and also through the tin coating thereon, this tin coating constituting the preferred form of cement that is adapted to flux in response to heat.

The bottle about which the cap is placed is externally enlarged at its mouth. In the structure of my invention, the ring is placed below this bottle enlargement and about the cap skirt and has mutually lapping portions that are united by a cement bond that holds these portions in ring contracting relation and permits these portions to be readily torn apart when the bottle is to be uncapped, at least one of the mutually lapping portions

having an unattached end which may be grasped for this purpose. While this cement bond is preferably applied or employed in accordance with the method of my invention, yet the structure of my invention is not to be limited to its production by my method nor is the method to be limited to the production of the structure of my invention. The ring is preferably formed of non-resilient metal so that it will not spring back into shape, in case of its enlargement by a tool in an effort to effect an unauthorized removal of the bottle cap. The enlargement of the bottle in the region of its mouth will prevent the withdrawal of the ring over the bottle mouth, in case removal of the bottle cap is sought without breaking the cement bond.

The method and structure of my invention will be more fully explained in connection with the accompanying drawing in which Fig. 1 is a perspective view of a bottle with a cap assembled therewith; Fig. 2 is a sectional view on line 2—2 of Fig. 1; Fig. 3 is a front view of a portion of the bottle in the zone of the ring, the mutually lapping portions of the ring being shown in section in order to illustrate the tin or cement coating thereon; Fig. 4 is an enlarged view of a portion of the bottle as it appears in Fig. 2; and Fig. 5 is a diagram illustrating a circuit arrangement whereby the cement coating upon the mutually lapping portions of the ring may be heated to flux the same for the purpose of uniting these mutually lapping ring portions while they are in ring contracting relation.

The bottle 1, illustrated, is one which is commonly employed for containing milk or cream. It has an external enlargement or surrounding bead 2 at the mouth of the bottle. It is customary to provide an annular seat 3 at the mouth of the bottle for receiving a paper closure disc 4, this closure disc, however, forming no essential part of my invention. A cap 5, preferably paper, is placed over the mouth of the bottle and over the closure disc 4, this cap having a skirt 6 integral therewith which is encircled by a ring 7, preferably formed of non-resilient metal, this ring having mutually lapping circumferentially extending portions 8 and 9. A cement bond 10 is dis-

posed between said mutually lapping and circumferentially extending ring portions and serves to hold these portions in assembly, the bond being brought into its holding relation after the ring portions 8 and 9 have been drawn circumferentially and in opposite directions with sufficient force to tightly hold the cap skirt against the neck of the bottle.

The cap employed is preferably of the construction disclosed in Patent 1,117,147, dated November 10, 1914. Such a cap permits the ring to be tightly placed into its skirt whereby the cap may have effective and sealing engagement with the bottle neck. The mutually lapping portions of the ring desirably terminate in free ends 8', 9' which may be grasped by a suitable tool in order that the mutually lapping ring portions may be torn apart when the bottle cap is to be removed. One of the free end portions 8', 9', say the portion 9', is desirably sufficiently long so that it may be grasped by the thumb and finger when the ring is to be broken. The two ring portions are desirably so related that one portion, say the portion 8, is above the other so that both may take part in gripping the cap without imposing undue strain upon the cement bond 10 between the mutually lapping ring portions.

The wire of the ring is tinned, the tin coating of the ring wire fluxing under a degree of heat which will not materially burn the paper of the cap. The heat for fluxing the tin upon the mutually lapping portions of the ring may be furnished by three pairs of dry battery cells 11 coupled in parallel and furnishing a pressure of, say, about 5 volts. The current from these battery cells is desirably applied while the mutually lapping portions of the ring are tightly drawn circumferentially of the bottle neck and in opposite directions and to an extent sufficient to contract the ring, as desired. When the current has caused the tin upon the mutually lapping portions of the ring to flux, the circuit is opened and the tin is allowed to harden while the ring is contracted, the solder thereafter holding the mutually lapping ring portions in contracting relation. As illustrated in Fig. 5, the terminals 12 and 13 of the battery circuit are preferably applied to the ring in a manner to include both mutually lapping ring portions directly therebetween. When the necessary fluxing has been effected, the terminals 12 and 13 may be removed or the circuit may be opened by the master switch 14, if desired.

It will be observed that the method of my invention is a material improvement upon the prior methods employed for contracting cap holding rings about the skirts of caps such as disclosed in Patent 947,502, dated January 25, 1910. It will also be observed

that the structure of my invention is a material improvement upon that disclosed in the first aforesaid Patent 1,117,147 in many respects among which is the ease with which the ring of my present invention may be broken in order that the cap held thereby may be removed from the bottle it covers.

I do not wish to be limited to the method herein disclosed for producing the product. It is obvious that changes may be made without departing from the invention.

Having thus described my invention, I claim:

1. The method of sealing a bottle which consists in placing a skirted cap over the mouth of the bottle and about the bottle neck; placing a metallic ring about the cap skirt and bottle neck; contracting the ring into tight engagement with the cap by relatively moving adjacent ring portions oppositely and circumferentially; placing a bond between said ring portions that is inclusive of cement that will flux in response to heat; passing sufficient electric current through a portion of said ring to heat the ring where adjacent the cement to a degree to flux the cement; and permitting the cement to harden while the ring is contracted to hold said ring portions in ring contracting relation.

2. The method of sealing a bottle which consists in placing a skirted cap over the mouth of the bottle and about the bottle neck; placing a metallic ring about the cap skirt and bottle neck; contracting the ring into tight engagement with the cap by relatively moving adjacent ring portions oppositely and circumferentially into mutually lapping relation; placing cement that will flux in response to heat between said mutually lapping ring portions; passing sufficient electric current through a portion of said ring to heat the ring where adjacent the cement to a degree to flux the cement; and permitting the cement to harden while the ring is contracted to hold said mutually lapping ring portions in ring contracting relation.

3. The method of sealing a bottle which consists in placing a skirted cap over the mouth of the bottle and about the bottle neck; placing a metallic ring about the cap skirt and bottle neck and which ring has cement upon a portion thereof that will flux in response to heat; contracting the ring into tight engagement with the cap by moving this ring portion and an adjacent ring portion relatively and oppositely and circumferentially into mutually lapping relation and to bring the cement between said mutually lapping ring portions; passing sufficient electric current through a portion of said ring to heat the ring where adjacent the cement to a degree to flux the cement; and permitting the cement to harden while the

ring is contracted to hold said mutually lapping ring portions in ring contracting relation.

4. The method of sealing a bottle which
 5 consists in placing a skirted cap of combustible material over the mouth of the bottle
 and about the bottle neck; placing a metallic
 ring about the cap skirt and bottle neck
 and which ring has adjacent portions capable
 10 of fluxing when subject to heat that is
 insufficient to harmfully burn the cap; contracting
 the ring into tight engagement with
 the cap by relatively moving said ring portions
 oppositely and circumferentially into
 15 mutually lapping relation; passing sufficient
 electric current through a portion of the
 ring to heat said ring portions sufficiently
 to cause said ring portions to flux and insufficiently
 to cause the cap to burn; and
 20 placing the fluxed ring portions in contact
 and permitting them to cool while in mutually
 lapping ring contracting relation to hold
 these ring portions in ring contracting relation.

25 5. The method of sealing a bottle which
 consists in placing a skirted cap over the
 mouth of the bottle and about the bottle
 neck; placing a ring about the cap skirt and
 bottle neck; contracting the ring into tight
 30 engagement with the cap by relatively moving
 adjacent ring portions oppositely and
 circumferentially; placing a bond between
 said ring portions that is inclusive of electric
 current conducting cement that will
 35 flux in response to heat; passing sufficient
 electric current through the cement to flux
 it; and permitting the cement to harden
 while the ring is contracted to hold said
 ring portions in ring contracting relation.

40 6. The method of sealing a bottle which
 consists in placing a skirted cap over the
 mouth of the bottle and about the bottle
 neck; placing a ring about the cap skirt and
 bottle neck; contracting the ring into tight
 45 engagement with the cap by relatively moving
 adjacent ring portions oppositely and
 circumferentially into mutually lapping relation;
 placing electric current conducting
 cement that will flux in response to heat between
 50 said mutually lapping ring portions;
 passing sufficient electric current through
 the cement to flux it; and permitting the cement
 to harden while the ring is contracted
 to hold said mutually lapping ring portions
 55 in ring contracting relation.

7. The method of sealing a bottle which
 consists in placing a skirted cap over the
 mouth of the bottle and about the bottle
 neck; placing a ring about the cap skirt and
 60 bottle neck and which ring has electric current
 conducting cement upon a portion thereof
 that will flux in response to heat;
 contracting the ring into tight engagement
 with the cap by moving this ring portion
 65 and an adjacent ring portion relatively and

oppositely and circumferentially into mutually
 lapping relation and to bring the cement
 between said mutually lapping ring
 portions; passing sufficient electric current
 through the cement to flux it; and permitting
 70 the cement to harden while the ring is
 contracted to hold said mutually lapping
 ring portions in ring contracting relation.

8. The method of sealing a bottle which
 consists in placing a skirted cap of combustible
 material over the mouth of the bottle
 and about the bottle neck; placing a metallic
 ring about the cap skirt and bottle neck and
 which ring has adjacent portions capable of
 fluxing when subject to heat that is insufficient
 to harmfully burn the cap; contracting
 75 the ring into tight engagement with the
 cap by relatively moving said ring portions
 oppositely; passing sufficient electric current
 through a portion of the ring to heat said ring
 portions sufficiently to cause said ring portions
 to flux and insufficiently to cause the cap
 80 to burn; and placing the fluxed ring portions
 in contact and permitting them to cool
 while in ring contracting relation to hold
 these ring portions in ring contracting relation.

9. The method of sealing a bottle which
 consists in placing a skirted cap over the
 mouth of the bottle and about the bottle
 neck; placing a metallic ring about the cap
 skirt and bottle neck and which ring includes
 a cement portion, before its application
 to the cap skirt, which will flux in
 response to heat; contracting the ring by
 relatively moving adjacent ring portions,
 inclusive of said cement portion, oppositely
 and circumferentially into mutually lapping
 relation; applying sufficient heat in the region
 of said mutually lapping ring portions
 95 to flux the cement; and permitting the cement
 to harden while the ring is contracted
 to hold said mutually lapping ring portions
 in ring contracting relation.

10. A bottle whose neck is externally enlarged
 at the mouth of the bottle; in combination
 with a skirted cap placed over the mouth
 of the bottle and about the bottle neck;
 and a metal ring tightly contracted about
 the skirt of the cap and bottle neck
 105 having mutually lapping portions extending
 circumferentially of the ring and provided
 with cement coatings upon their adjacent
 faces, prior to the application of the ring
 to the cap skirt, and which cement coatings
 flux in response to heat, these coatings
 being fluxed together to form a cement bond
 between said ring portions, said ring being
 below the enlargement at the mouth of the
 bottle.

11. The method of sealing a bottle which
 consists in placing a skirted cap over the
 mouth of the bottle and about the bottle
 neck; placing a ring about the cap skirt and
 bottle neck and which ring includes a cement
 125
 130

portion, before its application to the cap skirt, which will flux in response to heat; contracting the ring by relatively moving adjacent ring portions, inclusive of said cement portion, oppositely and circumferentially into mutually lapping relation; applying sufficient heat in the region of said mutually lapping ring portions to flux the cement; and permitting the cement to harden while the ring is contracted to hold said mutually lapping ring portions in ring contracting relation.

12. The method of sealing a bottle which consists in placing a skirted cap over the mouth of the bottle and about the bottle neck; placing a ring about the cap skirt and bottle neck; contracting the ring by relatively moving adjacent ring portions oppositely and circumferentially into mutually lapping relation; placing bonding cement which will flux in response to heat at said

mutually lapping ring portions; heating said cement to flux it; and permitting the cement to harden while the ring is contracted to hold said mutually lapping ring portions in ring contracting relation.

13. The method of sealing a bottle which consists in placing a skirted cap over the mouth of the bottle and about the bottle neck; placing a ring upon the cap skirt and bottle neck; contracting the ring by relatively moving adjacent ring portions oppositely and circumferentially; placing bonding cement which will flux in response to heat at said ring portions; heating said cement to flux it; and permitting the cement to harden while the ring is contracted to hold said ring portions in ring contracting relation.

In witness whereof, I hereunto subscribe my name.

OLOF N. TEVANDER.